DEPARTMENT OF AGRICULTURE
INDUSTRIÆ NIHIL IMPOSSIBILE
VICTORIA

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Department of Lands and Agriculture, Victoria.

THIRD ANNUAL REPORT

OF THE

SECRETARY FOR AGRICULTURE.

MELBOURNE:
BY AUTHORITY: GEORGE SKINNER, ACTING GOVERNMENT PRINTER.

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REPORT.

TO THE HONORABLE THE MINISTER OF LANDS AND AGRICULTURE, ETC., ETC., ETC.

Department of Agriculture,
Melbourne, 1st June 1875.

SIR,

I have the honor to submit for your consideration the Third Annual Report of this department. The season 1874–5 has been marked by a general immunity from disease among our crops. No complaints have been made of the appearance of rust among cereals or of any disorder among farm crops in general, and our vineyards, almost without exception, have been free from the oïdium and the black spot. The yield of grain has been equal to the average of late years, while the produce of our vines has excelled by far that of any former vintage in point of quantity, and, in a majority of instances, likewise in point of quality. The agriculture of the country is rapidly undergoing change, and the spendthrift system of continuous grain-growing is fast giving place to a rational course of husbandry, into which the keeping of sheep enters largely. So rapid, indeed, has been the change, that, within three years, the sheep on farms, from being numerically equal to about one-half of those upon stations, have been increased until they now exceed in number sheep upon stations; the relative figures being, 5,694,391 on farms, and 5,526,645 upon stations. In short, evidence of increased stability is noticeable on all sides, and farming pursuits are viewed less disparagingly than heretofore.

In January last, in a letter that I addressed to the Secretary to the Commissioners of the Philadelphia Exhibition, I stated that,

in my opinion, steps should be taken to obtain and disseminate throughout Victoria full information regarding the various agricultural labor-saving machines exhibited at Philadelphia; and further that, in my judgment, this could be best accomplished by sending to Philadelphia some person specially qualified to examine and report fully upon that section of the exhibition. The Americans are greatly in advance of us in matters appertaining to the invention and manufacture of agricultural machinery; and seeing that the conditions of the labor market in America and Australia are not dissimilar, and that the success of agricultural operations in Australia is equally as dependent upon the perfection to which labor-saving machinery can be brought, as is the progress of agriculture in the United States, I consider the acquisition and dissemination of such a report would confer a great boon upon the agriculturists of this country. The Royal Agricultural Society of England commissioned Professor Wrightson, Professor of Agriculture in the Royal Agricultural College, Cirencester, to report upon the agricultural division of the Vienna Exhibition, and to report at the same time upon the agriculture of Austro-Hungary. Should the Government see fit to send some person to Philadelphia to report on the agricultural division of the forthcoming International Exhibition, but more particularly upon the machinery section, that person should, in my opinion, be likewise instructed to obtain particulars and to report upon the working of the Act of Congress, passed on the 2nd July 1862, donating public lands to the several states and territories, in order to provide colleges for the benefit of agriculture and the mechanic arts, and the organization of the colleges that have been established thereunder. Information on this subject would be valuable at this juncture, when it is contemplated to establish agricultural colleges in Victoria.

In my last Annual Report, I dwelt at considerable length upon the subject of agricultural education. I showed how the disastrous consequences of the potato famine, which made its appearance in Ireland in 1846, led to the establishment, at the public expense, of a system of agricultural education in that country, by

the instrumentality of which a knowledge of the rotation of crops had been introduced into districts where rotation cropping was previously unknown, and where the potato and the oat constituted the only crops formerly cultivated; and how the systematic exhaustion of the soil of the United States of America had prompted the Government of that country to establish and richly endow agricultural colleges throughout the length and breadth of that land. I referred likewise more or less fully to the systems of agricultural education extant in England, Scotland, and some of the leading countries of continental Europe, and sketched out a system such as I deemed to be applicable to Victoria. Since my last Report was penned, steps have been taken to secure sites for future colleges of agriculture. One site has been obtained in the North-Eastern District, in the immediate vicinity of the township of Dookie; and another has been secured in the Bullarook State Forest, about three miles west from the township of Trentham. The latter site was chosen for the purpose of affording facilities for the establishment of a school of forestry in connexion with the proposed college, after the model of the German schools of agriculture and forestry. We can, however, only hope to make gradual progress in this matter. The subject will not admit of being hastily dealt with. In America, after thirteen years' experience in the organization and management of agricultural colleges, during which time many errors have been committed, they are only now beginning to discover the precautions that should have been taken at the time of their foundation, and to fully appreciate the great good which these institutions are destined to perform. We would be able to start with the full benefit of the experience gained by the Americans, and thus be spared the expenditure of much time and means in useless directions. America modelled her system of agricultural education upon the systems extant in Europe, more particularly upon the German system; but time revealed the necessity for some modification of the European system, in order to adapt it to a country differing so widely in its social and political aspects, and improvements were accordingly introduced from time to time.

Seeing then how nearly we assimilate to America in our social and political aspects, we should avail ourselves of the experience which she has gained in the matter of agricultural education at no inconsiderable outlay of time and means. The establishment of schools of agriculture, it should be remembered, is a progressive work; hence we should not expect the culmination of a century of progress in a moment of time.

Although farmers, as a class, are numerically much more powerful than any other section of the community, yet how few among their number take an interest in public matters that affect their position collectively. This is not as matters should be. Farmers should not be dependent upon persons to represent them in public who cannot fully know or appreciate the requirements of the agricultural interest; they should be so educated and trained as to qualify them to perform such work for themselves. It is desirable, therefore, even more, it is imperative, that farmers should form clubs, and meet together regularly to discuss those public questions which affect their calling, and to discuss the many matters which relate to their daily avocation; for example, the breeding and management of stock, the improvement of farm implements, the education of the rising generation of farmers up to a standard commensurate with the position that they occupy and the importance of their class in the country, the sources and application of manures, drainage, the relative value of the different descriptions of farm stock, and questions of a similar character. Farmers should not be at the mercy of others to represent them in public; they should be less reserved, and should strive to obtain for agriculture its proper rank as a profession. Their occupation should take its proper position, and exert its proportionate influence in the country. It is earnestly hoped that a farmers' club may be established at no distant date in connexion with each agricultural society, and that these institutions may then exert a much wider influence in the country, and tend even more effectually to promote the interests of agriculture.

Among the efficient means of promoting interest in agriculture

and disseminating useful agricultural information, farmers' clubs occupy a prominent position. Three such clubs may be said to be firmly established in Victoria; namely, the Ballarat, Warrnambool, and Romsey farmers' clubs. The papers read before these clubs possess frequently a high order of merit, and compare favorably with the papers read before similar institutions in England and the United States. The scope of our farmers' clubs, however, it is to be regretted, is not so wide as is that of kindred institutions in the two last-named countries. In England, a paper is seldom read that is not followed by an animated discussion, which not only affords members an opportunity of expressing their views upon the subject matter of the paper, but certainly doubles its value as a source of public information. In the United States, farmers' clubs are not confined to the reading and discussion of papers. They strive likewise to promote acquaintance and friendship among neighbours, to improve their members in the arts of public reading and speaking, and to advance the improvement of farms, farm implements, live-stock, buildings, and indeed every department of agriculture. The members are trained in the art of impromptu speech, by power being given to the president to call upon any one of the members present to speak for five minutes without preparation upon any purely agricultural subject that he may give him. This highly desirable feature might, I think, be introduced with much benefit at the meetings of farmers' clubs in Victoria; for it must be admitted that farmers, as a rule, for the want of such training, are unable, when assembled in public, to communicate freely their ideas on subjects with which practically they are intimately acquainted. Our farmers' clubs are too apt to be content with the reading and discussion of papers; they would do well to extend their operations in the lines laid down by the kindred institution of the United States. For the purpose of illustrating the nature and importance of the work performed by the farmers' clubs of Victoria, some of the more meritorious papers read before the different clubs during the past twelve months are given in another portion of this volume.

The success that has attended the efforts of the Smeaton Agricultural Society to encourage an improved system of farm management, by offering prizes for the best managed farms in the Smeaton agricultural district, has induced me to publish in another part of this volume the judges' reports upon the farms over 100 acres in extent that were entered for competition. A reference to these reports will show the thoroughness of the system of husbandry now pursued in that district when compared with the exhaustive system of continuous grain-growing that was followed only a few years ago.

With a view to represent the gradual development and present proportions of the farming interest, I have obtained from Mr. Hayter, Government Statist, certain statistical tables, which are printed below. On reference to the first set of tables, it will be seen that, between the 31st March 1869 and the 31st March 1875, horses on farms* have increased by 41,498, cattle by 307,577, sheep by 3,286,149, and pigs by 4,746, while the total increase of live-stock on farms is represented by no less than 3,639,970 head. In other words, the live-stock on farms during the period referred to has been more than doubled, while the area occupied has increased by 4,032,302 acres, or only by sixty-two per cent. of the area occupied at the commencement of 1869—namely, 6,491,363 acres. Again, if we refer to the same series of tables, we shall find that horses on stations have decreased during the same period by 5,178, cattle by 42,601, sheep by 1,821,932, and pigs by 3,011, while the total decrease in live-stock on stations is represented by 1,872,722 head, or by about twenty-five per cent. of the number returned on the 31st March 1869, while the area occupied has decreased by 3,456,576 acres, or only by eleven and three-quarters per cent. of that occupied at the commencement of 1869—namely, 29,427,615 acres. Thus there is, at the present time, more live-stock of every description on farms than upon stations; and what is most noteworthy, sheep on farms, within a period of six years, from being less by 4,940,335 head than sheep on stations, have increased until they now exceed in numbers

* Farms include all alienated lands unconnected with stations.

sheep on stations by 167,746 head. Further, the total live-stock on farms exceeds that on stations by 1,081,421 head, the numbers being respectively 6,789,655 head on farms and 5,708,234 head on stations, while the area occupied under the head "farms" is 10,523,665 acres, and under the head "stations" 25,971,039 acres.

A reference to the second series of tables will show that the increase in the value of machinery and improvements on farms during the six years from the 31st March 1869 to the 31st March 1875 represents £3,450,001, or a little over forty per cent. Further, that the value of machinery and improvements on stations during the same period has decreased by £481,577, or by about twenty per cent.

The third series of tables gives the number of hands employed on farms and stations respectively. It will be seen that the number of hands employed on farms has increased gradually from 60,711 in 1869 to 81,751 in 1875, while the number employed on stations has steadily decreased from 7,591 to 5,913. At the present time, therefore, for every one person employed on stations fourteen persons are employed on farms; and if we make the area occupied as stations and farms respectively the basis of calculation, we shall find that per acre thirty-four times more labor is employed on farms than on stations.

Live-Stock on Farms and Stations.

Return showing the Number of Horses, Cattle, Sheep, and Pigs upon Farms and upon Squatting Stations on the 31st March 1869, 31st March 1872, and 31st March 1875 respectively.

Return showing Number on 31st March 1869.

Description of Land.	Description of Live-Stock.				
	Horses.	Cattle.	Sheep.	Pigs.	Total.
Farms and lands unconnected with stations	119,900	492,542	2,408,242	129,001	3,149,685
Crown and alienated land connected with stations ...	24,034	201,140	7,348,577	7,205	7,580,956
Total	143,934	693,682	9,756,819	136,206	10,730,641

RETURN SHOWING NUMBER ON 31ST MARCH 1872.

Description of Land.	Description of Live-Stock.				
	Horses.	Cattle.	Sheep.	Pigs.	Total.
Farms and lands unconnected with stations	161,075	636,589	3,814,698	171,684	4,784,046
Crown and alienated land connected with stations ...	20,568	162,920	6,187,683	5,763	6,376,934
Total	181,643	799,509	10,002,381	177,447	11,160,980

RETURN SHOWING NUMBER ON 31ST MARCH 1875.

Farms and lands unconnected with stations	161,398	800,119	5,694,391	133,747	6,789,655
Crown and alienated land connected with stations ...	18,856	158,539	5,526,645	4,194	5,708,234
Total	180,254	958,658	11,221,036	137,941	12,497,889

H. H. HAYTER, Government Statist.

AGRICULTURAL MACHINERY AND IMPROVEMENTS ON FARMS AND STATIONS.

RETURN showing the Approximate Value of the Agricultural Machinery and Improvements upon Farms and upon Squatting Stations during the Years ending 31st March 1869, 31st March 1872, and 31st March 1875 respectively.

RETURN FOR YEAR ENDING 31ST MARCH 1869.

Description of Holdings,	Approximate Value of—		
	Agricultural Implements and Machinery.	Improvements.*	Total.
	£	£	£
Holdings unconnected with stations ...	1,144,489	7,302,677	8,447,166
Stations	83,721	2,399,123	2,482,844
Total	1,228,210	9,701,800	10,930,010

RETURN FOR YEAR ENDING 31ST MARCH 1872.

Holdings unconnected with stations ...	1,373,872	8,547,279	9,921,151
Stations	78,329	1,784,923	1,863,252
Total	1,452,201	10,332,202	11,784,403

* This column includes the value of buildings of all descriptions, fencing, dips, wells, dams, &c., but not the cost of clearing or cropping land.

RETURN FOR YEAR ENDING 31ST MARCH 1875.

Description of Holdings.	Approximate value of—		
	Agricultural Implements and Machinery.	Improvements.*	Total.
	£	£	£
Holdings unconnected with stations ...	1,486,558	10,410,609	11,897,167
Stations	80,751	1,920,516	2,001,267
Total	1,567,309	12,331,125	13,898,434

* This column includes the value of buildings of all descriptions, fencing, dips, wells, dams, &c., but not the cost of clearing or cropping land.

H. H. HAYTER, Government Statist.

HANDS EMPLOYED ON FARMS AND STATIONS.

RETURN showing the Number of Persons of both Sexes employed on Farms and Stations during the Years ending 31st March 1869, 31st March 1872, and 31st March 1875 respectively.

RETURN FOR YEAR ENDING 31ST MARCH 1869.

Description of Holdings.	Number of Hands employed.		
	Males.	Females.	Total.
Holdings unconnected with stations ...	41,242	19,469	60,711
Stations	5,798	1,793	7,591
Total	47,040	21,262	68,302

RETURN FOR YEAR ENDING 31ST MARCH 1872.

Holdings unconnected with stations ...	49,798	23,754	73,552
Stations	4,514	1,336	5,850
Total	54,312	25,090	79,402

RETURN FOR YEAR ENDING 31ST MARCH 1875.

Holdings unconnected with stations ...	56,520	25,231	81,751
Stations	4,638	1,275	5,913
Total	61,158	26,506	87,664

H. H. HAYTER, Government Statist.

A system of exchange has been established with the Department of Agriculture and the leading agricultural societies of foreign countries, and the annual reports and other publications issued by those institutions are now regularly received by this department. This system of exchange, however, is not limited to the interchange of publications. A number of packets of seed, principally varieties of forest trees and flowering shrubs, have been received from the Department of Agriculture of the United States. These seeds have been handed to the Inspector of State Forests and the Curator of the Botanical Gardens for propagation, the tree seeds having been entrusted to the former, the seeds of flowering shrubs to the latter officer. The department hopes to receive, after next seed time, a number of varieties of cereal and other agricultural seeds through the agency of the Boards of Agriculture of the undermentioned American States—namely, California, Connecticut, Georgia, Illinois, Indiana, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, and Wisconsin. It is proposed to distribute these seeds, when they shall arrive, to farmers, through the medium of the agricultural societies. It should be distinctly understood, however, that no seeds will be sent out by this department in sufficient quantity to produce a crop, but only in small portions for experimental culture, the object being the introduction of varieties such as cannot be readily procured by the farmer, not the distribution of common or even rare seeds in quantity. Should this contemplated distribution of seeds result, as a similar distribution by the United States Department of Agriculture has done, in the introduction of more prolific varieties of cereals than we now possess, the main object of the distribution will have been attained.

Since the above was written, I have received from the Japanese Agricultural Officials some seeds of varieties of radish, turnip, bean, lettuce, sesamum, &c., which I have distributed in small quantities for experimental culture.

The importance of encouraging an interchange of cereal and other agricultural seeds between this department and the departments of agriculture in foreign countries cannot be easily overestimated. It is universally admitted that deterioration in the plant can only be checked by a judicious adaptation of the seed to the soil. The necessity for frequent change of seed is duly recognized by agriculturists in all parts of the world, and the benefits arising therefrom are strikingly set forth in the following quotations :—"As shown by the annual report of the department of 1868, the wheat crop reached 224,036,600 bushels ; acreage, 18,460,132 ; average yield per acre, 21·1 bushels ; value of crop, 319,195,290 dols. ; average price per bushel, 1·42 dols. The reports of experiments with Tappahannock wheat, distributed by the department, show an average yield per acre of twenty-five bushels ; the total yield at that rate, on the acreage of 1868, would be 461,503,300 bushels, an increase of 237,466,700 bushels ; which, at 1·42 dols. per bushel, would be a money value increase of 337,202,714 dols. If this wheat were to take the place of other varieties, however, and should be sown as the general crop is now sown, without the special care usual in experimenting, the average yield would, of course, fall below twenty-five bushels ; but if the average increase per acre could be raised to fifteen bushels (a low estimate for the Tappahannock), the increase in bushels would be 55,380,396 ; in money value, 78,640,162 dols."

"The oat crop of 1868 was 254,960,800 bushels ; acreage, 9,665,736 ; average yield per acre, 26·3 bushels ; value of crop, 142,484,910 dols. ; average price per bushel, 55 cents. Reports of experiments with the Excelsior oats, a new variety, introduced by the department, show an average production of forty bushels per acre, sixty bushels not being an uncommon yield. Estimating the average yield, if generally introduced, at 30·3 bushels, an increase of four bushels per acre over the average yield of 1868, and the addition to the wealth of the country in the item of oats would be 38,662,944 bushels, or 21,264,619 dols."

"The weight of the product of the Excelsior oats for a few years after their introduction may be fairly averaged at twenty per cent. above the common varieties, estimating the latter at thirty pounds to the bushel and the former at thirty-six, although in many cases forty and forty-five pounds per measured bushel have been reported. Add twenty per cent. to the sum above ascertained, and an increase will be shown of 25,517,542 dols."*

This department cannot, however, expect to receive seeds free of all cost from foreign institutions unless it is prepared to reciprocate; and this cannot be done unless funds are placed at its disposal to meet the necessary expenditure.

The National Exhibition of Live-Stock, Implements, Dairy Produce, &c., held at Melbourne, on the 2nd, 3rd, and 4th November 1874, under the auspices of this department, and in connexion with the National Agricultural Society of Victoria, was pronounced an unprecedented success. The machinery and implement classes, as is usual at the metropolitan show, were well filled, and the exhibition in this respect is said to have been the best ever held in the southern hemisphere. The classes for all descriptions of live-stock were well represented. The display of horses was creditable to the society, notwithstanding the almost total absence of aged draught entires, which was due to the society having held its show of stallions some two months prior to the date of its spring exhibition. Cattle were exhibited in great numbers. The show of shorthorns, as regards both the number and quality of the exhibits, is said to have been unsurpassed by any exhibition held in Victoria or the adjacent colonies. The majority of the leading herds of Victoria were well represented, and exhibits were obtained likewise from New South Wales, thus giving to the exhibition an intercolonial as well as a national character. Herefords were shown in greater numbers than at any show previously held by the National Society; and the exhibitors, as in the case of shorthorns, were not confined to Victorian breeders. Sheep were well represented in the long-woolled sections; but merinoes were only sparingly shown, owing to the

* Report United States Department of Agriculture for 1869, p. 244.

restrictions to travelling imposed by the Scab Act. Dairy produce was exhibited in considerable quantity. The show of cheese is said to have surpassed, in point of quality, that exhibited on any former occasion. Alderney, Ayrshire, and Brittany cattle, dairy cows and heifers, fat cattle, swine, and poultry, were all represented; and not the least attractive feature of the exhibition was the shearing competition, arranged by Mr. C. B. Fisher, who defrayed the whole cost connected with it. Altogether, the exhibition was a marked success; and was instrumental in inducing at least one of the large breeders of the Western District to submit his stock to competition, and the principal breeders both of cattle and sheep in the adjacent colonies to exhibit their stock on Victorian soil.

The vintage of 1875 has surpassed, in point of productiveness, that of any previous year, while the quality of the musts is said to equal, in some instances even to excel, that of former vintages. In every vine-growing district of the colony the yield of wine is reported to have exceeded the average of years, and in some it has amounted even to double of that yet obtained in one season. The Tabilk vineyard alone has yielded this vintage 68,000 gallons of wine, or about 525 gallons per acre over its entire area. This vineyard is larger, by about twenty acres, than any other vineyard in Victoria, the area in full bearing being 130 acres. It is most satisfactory to report that our wines continue to meet with high commendation at the hands of European connoisseurs. The position that they took at the Vienna Exhibition, and the laudatory remarks of the jurors, particularly upon the samples of hermitage sent from Victoria, which they confessed their inability to distinguish from the famous wine of the Dronne, will assist greatly to permanently place the Australian wines upon the English market. In no country does the vine flourish better than in Australia, and in none is a greater range of climate to be found within a comparatively limited area. Victoria alone possesses, between the sea and the river Murray, every variety of soil and climate that is to be met with in the wine-growing countries

of Europe. The vineyard interest of Victoria increases in importance every year; and it may, I think, be confidently said that the day is not far distant when this important industry will have overcome the difficulties which always attend the establishment of new undertakings, particularly when these take the form of luxuries for which it is sought to procure a permanent market.

The library of the department has been augmented during the past year by exchanges. I have to acknowledge the receipt of eleven volumes from the Illinois State Department of Agriculture, being a complete series of its reports from 1853 to 1873; from the Wisconsin State Agricultural Society, of copies of its report for the years 1871, 1872–3, and 1873–4; from the Massachusetts State Board of Agriculture, of copies of its report for 1873–4, and 1874–5; from the Kansas State Board of Agriculture, of two copies of its report for 1874; from the Department of Agriculture of Buenos Ayres, of a complete series of its reports; likewise of copies of the proceedings of the Highland and Agricultural Society of Scotland, and the Royal Agricultural Society of England; also statistical volumes from Mr. G. I. Harney, Secretary to the Department of State, Massachusetts; and sundry books and pamphlets from other sources. The departmental library is already perhaps the most complete agricultural library in Victoria, and will yearly increase in value. Arrangements have been made by which the public can have access to the library, but no books will be permitted to be removed.

A paper on the meteorology of Victoria for the year 1874 has been contributed by the department of the Government Astronomer. I was enabled, by the kindness of Mr. Ellery, F.R.S., Government Astronomer, to publish in my last Annual Report a complete record of the meteorological observations of agricultural importance made and recorded in Victoria from the earliest times to the close of the year 1873. The paper now published is a continuation of the subject, and brings these observations up to the end of the year 1874. It is intended, from year to year, to publish details of the observations made at Melbourne and the

several stations in the country districts, that they may serve as a ready means of reference for agriculturists throughout the colony.

Steps have been taken to encourage the invention and manufacture of flax-harvesting machinery. In my Report for 1874, I stated that this department had decided to offer premiums for this purpose jointly with the Adelaide Chamber of Manufactures and the Royal Agricultural Society of South Australia. A code of conditions to regulate the projected intercolonial competition was published in the *Government Gazette* for the 15th May 1874, and at page 298 of my Report for the same year. Three machines, all of South Australian manufacture, were entered for competition, but of these two only were brought to trial. Arrangements were made to hold the first trial of the competing machines in Adelaide, on the 20th November 1874; but the unusually hot weather experienced during the month of October accelerated the ripening of the flax crop, and the date of trial had to be altered at the eleventh hour to the 30th October. Owing to this change of date, the Victorian judges were unable to attend the trial, for it had been previously pointed out that they could not leave Melbourne until after the holding of the National Agricultural Show, which had been fixed for the 2nd, 3rd, and 4th of November. The trial was not attended with success, the judges having reported that the machines were not worthy of either of the prizes offered. They recommended that neither of the advertised prizes should be awarded, but that a sum of £20 should be divided equally between the competitors, Messrs. J. W. Bull and D. Hutton, in consideration of the expenses to which they had been put, and in recognition of the enterprise they had displayed in endeavouring to meet a great public want. As no Victorian machines had been entered for competition, and the machines tried in Adelaide had proved unsuccessful, it was deemed undesirable to incur the expense of a second trial of the machines in Melbourne; but the judges recommended that the money voted should be again offered for competition the following season.

A sum (£1,000) having been placed on the Estimates 1874–5 for the "Encouragement of the Growth and Production of Flax and Silk," £300 of that amount was set apart for the encouragement of the production of the latter substance, and was made available under regulations which are published at page 226. It was impossible to take any further action in the matter of this vote, as the money did not become available until the season was too far advanced to permit of its expenditure within the then current financial year; and hence nothing could be done beyond the promulgation of regulations setting forth the conditions under which it was proposed to distribute the vote. I desire to bring under your notice the impracticability of the existing mode of voting moneys, when applied to the encouragement of the production of new crops, or to the introduction of new agricultural industries. If a sum of money be placed on the Estimates for any such purpose—the growth of flax or the production of silk, for example—it does not become available until the Appropriation Act has been passed, or not, as a rule, until the commencement to the middle of December. Now, should a vote be taken for the encouragement of the growth of flax, the money will not be available until after the flax crop has been sown and harvested, and the time for sowing the next crop will not arrive until the money voted for its encouragement has lapsed. The same holds good, in a measure, with respect to the encouragement of the production of silk. I would suggest the propriety either of introducing a short Bill, after the model of the Bonus Act of South Australia, to provide that moneys voted for the encouragement of new industries shall be available during five years, or of attaching a condition to all such votes that would render them available during a like period.

No claim has been made upon the grant in aid of the manufacture of sugar from beet-root grown in Victoria. The company that made a claim upon the vote for 1874–5, but failed to substantiate the same, has been since dissolved. It was deemed expedient, after this dissolution had been brought about, to issue

a new code of regulations to guard against misunderstandings in future, and to provide for the payment of the bonus by smaller instalments. The regulations under which the Victorian Beet-root Sugar Company commenced operations were framed before this department was established, and it was accordingly deemed inexpedient to make any change in them until the company should have had an opportunity of making a claim upon the vote thereunder. The new regulations are published at page 223.

Nothing has been done in the matter of the grant of £580 for the "Invention and Manufacture of a Mechanical Reaper and Binder," owing to the conditions upon which the grant was made —viz., that it should be available only provided a similar amount was contributed by the Agricultural Societies—having been un-complied with. It is satisfactory to report that considerable progress has been made during the past year in the invention of reaping and binding machinery, and that there is still hope of this long-felt want being supplied. Several persons are engaged upon inventions, and many have already patented their machines. It is proposed that this department shall take this matter in hand, and, should Parliament place funds at its disposal, steps will be taken to hold trials during the coming harvest.

The vote in aid of the Agricultural Societies has been distributed in conformity with the regulations published at page 228, in every instance in which the societies could avail themselves of the advantages which these regulations offer. It was contended by some of the societies that insufficient notice had been given of the coming into force of new regulations, and upon these grounds they asked that their claims might be considered, and a sum allowed them which would be equal to the amount that they would have received had regulations similar to those of the previous year remained in force. This request was conceded, but with the distinct understanding that, in future, all of the societies should conform to the new regulations. These new regulations were framed for the express purpose of increasing the stability and extending the usefulness of the societies—on the one hand,

by making it imperative upon them to take steps towards the augmentation of their member rolls, and, on the other, by discountenancing the application of their funds for the encouragement of other than legitimate agricultural exhibits. It is satisfactory to note that the regulations have been instrumental in directing attention to these points. At the annual meeting of the Villiers and Heytesbury Agricultural Association it was pointed out that the association would have been some £88 10s. 8d. better off had its collector done his duty ; for had he collected some £50 more, the association would have been entitled to claim £38 10s. 8d. additional from the Government. The Bendigo Agricultural and Horticultural Society, whose member roll formerly has fallen much below that of the other leading societies, is making strenuous efforts to interest the public in its behalf, and to induce persons to allow their names to be placed upon the member list. Altogether, a more satisfactory state of things is being brought about.

The vote in aid of the Horticultural Societies has been distributed in conformity with regulations approved by the Governor in Council. The claims amounted in the total to a sum greatly in excess of the grant, and accordingly had to be reduced *pro rata*. The schedule of distribution is published at page 227.

The work of the chemical division has been greatly retarded by the time of the officer in charge, Mr. Ivey, having been devoted principally to his duties in connexion with the forest branch. The first portion of the year was given up entirely to forest work, and it is only latterly, since Mr. Ivey has been relieved of correspondence, that he has been able to devote any portion of his time to analysis. Notwithstanding, a creditable amount of work has been accomplished. Analyses have been made of soils from various districts, the most important being those of soils from the region of the mallee scrub. Analysis has proved these soils to contain all of the elements of fertility. It is not sufficient, however, that a soil contain all of these elements ; to produce fertility, they must be present in proper forms of combination. The mechanical

admixture of a soil, and the climate of the locality in which it is found, are equally conducive to fertility as the presence in it of all the elements of plant food. If a soil be too tenacious on the one hand, or too shallow and porous on the other, its fertility will be impaired, notwithstanding that it contains all of the elements of plant food in profusion. Again, if a district be naturally dry, and subject at times to a long continuance of drought, the soil, though it possess every condition of fertility, will be unable to support a sufficiency of vegetation to render profitable its occupation in small areas for agricultural purposes. The soil in parts of the mallee scrub country, as a reference to the chemist's report will show, is rich in the elements of plant food, but the aridity of the climate renders those regions undesirable for agricultural settlement. Soil analysis is of service only in so far as it enables us to detect the absence of an essential ingredient, or the presence of a plant poison. Analyses have been made likewise of manurial matters, and of various substances that have been forwarded to the department by residents in country districts, or through agricultural societies. It is to be regretted that the work of this branch should be obstructed by the officer in charge being called upon to perform the duties appertaining to two offices; and it is hoped that, at no distant date, the desirability of appointing an officer to take charge of each division may be entertained. The chemist would then be able to take up regular lines of investigation, and to devote more time to the examination of substances transmitted to the department by the agricultural societies.

The management of the forests has been recently entrusted to this department. Since this change has been made, steps have been taken to place each State forest reserve in charge of a competent caretaker. The persons appointed, five in number, were selected out of a large number of candidates by a board consisting of the Assistant Surveyor-General, the Inspector of Bailiffs, and Mr. Ivey, and were placed in charge of the Barmah and Yielima, Gunbower, Mount Macedon, and the eastern and western divisions

of the Bullarook State Forests respectively. The caretakers, since their appointment, have been engaged principally in reporting upon the forests placed under their control ; and it is satisfactory to report that these appointments, in every instance, have been followed by a considerable increase to the revenue derived from the forests to the charge of which these persons have been appointed. At an early date, a Bill dealing with the whole question of our timber supply will be submitted for your consideration.

I have again the honor to refer to the desirability of placing this department under the provisions of an Act of Parliament. Upon former occasions, I have instanced the difficulties with which I have to contend, owing to the absence of any definition as to the subjects over which this department shall have control, and have observed that in every other country in which a Department of Agriculture has been established, the subjects over which it should have control have been defined by Act of Parliament. The Act under which the Department of Agriculture of the United States is established provides that the general designs and duties of the department shall be to acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word, and to procure, propagate, and distribute among the people new and valuable seeds and plants. It provides further for the appointment of a " Commissioner of Agriculture," and defines his duties to be as follow : namely, to acquire and preserve in his department all information concerning agriculture which he can obtain by means of books and correspondence, and by practical and scientific experiments, by the collection of statistics, and by any other appropriate means within his power ; to collect, as he may be able, new and valuable seeds and plants ; to test, by cultivation, the value of such of them as may require such tests ; to propagate such as may be worthy of propagation, and to distribute them among agriculturists ; to report annually to Congress the proceedings of his department, and to make special reports on subjects in his charge when he shall deem such

to be necessary. The Act further provides for the appointment of a chief clerk and other necessary officers, including chemists, botanists, entomologists, and other persons skilled in the natural sciences pertaining to agriculture. The foregoing is briefly the Agricultural Act of the United States, and it differs in no important points from similar Acts in other countries. The existance of such an Act in Victoria would be immensely beneficial to this department.

I have the honor to be, Sir,
Your most obedient servant,

A. R. WALLIS,
Secretary for Agriculture.

REPORT OF THE CHEMIST.

SIR,

I have the honor to submit my Report of the work done during the small portion of the past twelve months that I have been able to devote to the laboratory of the department.

Between the 13th July 1874 and the 5th March 1875 my time was wholly occupied with duties connected with the forests. The following Report is then merely one of operations conducted during such portion of four months as I have been able to devote to laboratory work.

The amount of time actually given to chemical work has been, therefore, lamentably small, barely sufficient to allow of the shadowing forth of a proposed scheme of operations for the immediate future. As, however, the laboratory is now attached to the new offices of the department, and as I have been relieved of much clerical work, I hope to be able to devote nearly half my time to chemical investigation.

My last Report consisted of two parts, in one of which was commenced an account of an investigation into the composition of Victorian virgin soils. This enquiry has since progressed but little, some half dozen soils of my own selection being all that have been analysed. Other soils that have been sent in for examination will, from their analyses, afford additional information in this direction, and in several instances, from their very peculiarities, are of more general value, as showing marked distinctive features which ordinarily selected soils would not exhibit.

From the slight amount of work yet done, it is altogether too early to venture an opinion upon the soils of the colony; enough has, however, been completed to point out the immense difference in the soils of different parts of the country, the vast areas of soils of good and average quality, and the great extent of country covered by certain soils of similar character.

Of volcanic soils, analyses have been made of samples from the older volcanic rocks at Berwick, the ranges beyond that township, from near the Black Spur, &c. Of soils derived from silurian rocks, samples from near Gembrook, from the Plenty Ranges, &c., have been examined; and of soils formed from more recent strata, samples from near Berwick, from near Timor, the Lower Loddon, Sorrento, and several from the mallee country near the Wimmera River and Lake Hindmarsh; and, lastly, of soils originating in admixtures of detritus from two or more formations a few analyses have been made.

The following are the results of analysis of soils of volcanic origin :—

RESULTS OF CHEMICAL ANALYSIS.—SOILS AND SUBSOILS OF VOLCANIC ORIGIN.

100 parts dried at 100° C. contain of—	Soil from near Berwick.	Subsoil from near Berwick.	Soil from Victoria State Forest.	Subsoil from Victoria State Forest.
Combustible matter and combined water (loss on ignition)... ...	16·610	14·238	16·784	10·645
Silica and silicates insoluble in hot hydrochloric acid	66·666	51·609	63·448	70·944
Soluble silica	·370	·335	·446	
Oxides of iron (calculated as ferric oxide)	5·398	12·358	19·074	18·000
Alumina	8·853	19·548		
Calcium (calculated as carbonate)	1·018	·335	trace	trace
Magnesium (calculated as carbonate)	·687	·726	...	...
Potash	·127	·400	·127	·096
Soda	·089		·122	·063
Chlorine	...	...	...	...
Phosphoric anhydride	·064	·049	·031	·036
Sulphuric anhydride	·083	·047	·091	trace.
Loss, &c.	·035	·355	...	·216
	100·000	100·000	100·123	100·000

The soil from near Berwick is of a dark-brown, nearly black color, resting upon decomposing trap rock. The percentage of lime is much larger than that found in soils from the felspathic porphyries of the volcanic ranges in the neighborhood of the Black Spur, evidencing the later age of the rocks from which it is derived.

RESULTS OF CHEMICAL ANALYSIS.

100 parts dried at 100° C. contain of—	Soils from the Upper Silurian Schists.			Soil from near Berwick, Older Volcanic Rock and Tertiary Drift.
	Soil from Ranges north of Pakenham.	Soil from near Gembrook.	Soil from the Plenty Ranges.	
Combustible matter and combined water (loss on ignition)... ...	18·459	17·944	19·676	10·561
Silica and silicates insoluble in hot hydrochloric acid	54·246	55·112	57·727	71·367
Soluble silica	·605		·214	·400
Iron (as ferric oxide)	12·713	25·623	7·910	15·947
Alumina	13·025		13·302	
Calcium (calculated as carbonate)	·099	·368	·265	·360
Magnesium (calculated as carbonate)	trace	trace	·299	·870
Potash	·134	·174	·260	·323
Soda	·171	·206		
Chlorine	...	...	...	...
Phosphoric anhydride	·079	·045	·072	·043
Sulphuric anhydride	...	·073	·115	·065
Loss, &c.	·469	·455	·160	·064
	100·000	100·000	100·000	100·000
Reaction	acid	acid	acid	...

The soils from the upper silurian schists, of which the last table gives the results of analysis, are all from forest land, and, though from different parts of the country, are very similar in character, but are unlike most of those analysed last year. This arises from their originating from argillaceous strata rather than from sandstone, the denser vegetation supported by the clayey soil having served to protect the soil from atmospheric action. We therefore find on ranges where strata of claystone or mudstone predominate a deep clayey soil covered with fine timber. These soils are always of fair quality, though, on being cleared, they contain too large a quantity of sour vegetable matter (acids of humus) to be favorable to the growth of cereals. The almost total absence of lime helps this unfavorable condition ; and, as a rule, it would be advisable in all cases where such land is cleared for cultivation, that, upon clearing off the scrub and dense vegetation, it should be sown down with grass, and remain in pasture for several years at least. All soils heavily timbered contain large proportions of vegetable matter, decaying roots, leaves, &c. The decay especially of the innumerable small rootlets of trees and scrub renders the soil porous to so great a degree that its consolidation is also a necessity to the successful cultivation upon it of cereals. This necessary consolidation can in no way be so profitably done as by the treading of sheep, and it would appear that the sowing with grass and feeding off with sheep is the proper course to pursue with lands of this description.

Soils derived from Rocks of the Tertiary Period.

A very large proportion of the area of the colony is occupied superficially by strata of the tertiary period, and by more recent deposits. Soils derived from these are very varied in their composition, being, in some instances, extremely tenacious clays ; in others, drift sand, or may be fine rich loams, at times more or less calcareous. These soils present, in their variety, points of greater interest than the comparatively uniform soils derived from the palæozoic rocks or those of igneous origin.

Limestones of different qualities, gypsum, selenite, dolomite, &c., are not infrequent in many parts of Victoria, and, in some cases, exert an influence on the soils in their vicinity ; though it is more often the case that soils overlying layers of limestone contain but very small quantities of lime. In other cases, an almost pure sand is found superimposed upon a plastic clay of extremely finely divided particles, and quite impervious to water. In such cases, we have a poor, wet, sandy soil—cold in winter through surface evaporation, dried up in summer, so soon

as the moisture is evaporated from the layer of sand lying upon the impermeable clay. Two soils presenting these features have been noticed out of the few yet examined—one being a naturally valuable soil, the only drawback being the extreme tenacity of the subjacent clay, which is sufficient to cause an otherwise fruitful soil to be quite barren, and to create a suspicion that such unfruitfulness is caused by the existence of some deleterious substance.

RESULTS OF CHEMICAL ANALYSIS OF SOILS AND SUBSOILS DERIVED FROM STRATA OF THE TERTIARY PERIOD.

100 parts dried at 100° C. contain of—	Soil from four miles west of Berwick.	Subsoil from four miles west of Berwick.	Soil from the Lower Loddon.	Soil from Point Nepean.
Combustible matter and combined water (loss on ignition) ...	6·531	8·508	7·194	6·897
Silica and silicates insoluble in hot hydrochloric acid	88·258	70·406	73·421	85·182
Soluble silica	·057	·083	...	...
Iron (calculated as ferric oxide)...	1·982	5·190	7·102	6·530
Alumina	2·914	15·282	11·527	
Calcium (calculated as carbonate)	·071	·082	·301	·821
Magnesic carbonate	...	...	...	·165
Potash	·066	·163	·368	·076
Soda	·070	·079		·117
Chlorine	...	...	...	...
Phosphoric anhydride	·033	·050	·066	·027
Sulphuric anhydride	·032	·080	trace	·054
Loss, &c.	...	·077	·021	·031
	100·014	100·000	100·000	100·000

100 parts dried at 100° C. contain of—	Soil from Point Nepean, No. 2.	Soil from Gippsland.	Soil from near Timor.	Subsoil from near Timor.	Calcareous Stratum from near Timor.
Combustible matter and combined water (loss on ignition) ...	7·049	16·702	3·401	5·480	3·875
Silica and silicates insoluble in hot hydrochloric acid	85·461	57·296	90·497	81·213	68·214
Soluble silica	·075	·475	...	...	...
Iron (calculated as ferric oxide)...	2·882	10·320	4·930	12·628	8·569
Alumina	4·045	13·852			
Calcium (calculated as carbonate)	·507	1·225	·419	·246	16·283
Magnesic carbonate	·081	...	·384	·392	2·581
Potash	·081	·160	...	Not determined	
Soda	·111	·269	Not determined		
Chlorine	...	...	...		
Phosphoric anhydride	·085	·049	·030		
Sulphuric anhydride	...	·135	·068		
Loss, &c.	...	...	·271	·041	·478
	100·377	100·483	100·000	100·000	100·000

RESULTS OF MECHANICAL ANALYSIS OF SOILS AND SUBSOILS.

Air-dried Samples contain in 100 parts—	Soil from four miles west of Berwick.	Subsoil from four miles west of Berwick.	Soil from near Berwick, Older Volcanic Rock and Tertiary Drift.	Subsoil from near Berwick, Older Volcanic Rock and Tertiary Drift.	Soil from near Berwick from Rock of Older Volcanic Period.	Subsoil from near Berwick from Rock of Older Volcanic Period.	Soil from Point Nepean, No. 2.
Moisture driven off at 100° C.	1·855	6·504	4·863	6·434	7·043	11·404	2·456
Combustible matter ...	6·233	7·955	10·076	7·843	15·440	12·847	6·886
Gravel...	1·587	5·341	1·966	3·333	...	·206	...
Gravelly sand ...	18·010	8·513	7·878	3·833	·835	·057	·326
Coarse sand	46·259	35·363	18·449	8·405	28·625	33·715	81·633
Fine sand	14·259	7·797	15·922	8·440	7·593	4·306	5·020
Impalpable sand and clay	11·797	28·527	40·846	61·712	40·464	37·465	3·679
	100·000	100·000	100·000	100·000	100·000	100·000	100·000

The soils analyzed were not selected by me, except in one instance, but are some of those sent in for examination. Some of them are poor sands overlying impermeable clays or a layer of limestone, others are loams of good quality. The sands are useful where the subsoil is of a favorable nature, but are of no value where this is not the case.

It will be observed in comparing the chemical and mechanical analyses of the soil from near Berwick with those of the subsoil what a vast difference is found in two layers of earth within seven or eight inches of one another. It would appear hardly possible that they could have been deposited under similar conditions.

In the case of soils from near Timor, it may be noticed that, although at a small depth there exists a layer of limestone, the surface soil contains but a very small proportion of this useful substance. The soils analyzed are, however, all too few to be considered as representing those derived from tertiary strata.

The following are results of analyses of soils from the mallee country, near the Wimmera River and Lake Hindmarsh.

Results of Chemical Analysis of Soils from the Mallee Country.

100 parts dried at 100° C. contain of—	No. 1. Soil from Lake Hindmarsh, west of the Wimmera River.	No. 2. Soil from Pepper's Plains, ten miles east of Wimmera River.	No. 3. Soil from twelve miles west of Warracknabeal.	No. 4. Soil from Warracknabeal.	No. 5. Soil from Wyn-wyn Run, north of Mount Arapiles.
Combustible matter and combined water (loss on ignition) ...	6·222	11·005	6·000	8·922	8·338
Silica and silicates insoluble in hot hydrochloric acid	86·747	63·930	82·966	80·216	80·753
Soluble silica	·154	·302	·196	·144	·134
Ferric oxide	2·436	4·567	2·567	2·544	2·555
Alumina	3·162	11·031	6·627	6·383	6·627
Calcium (calculated as carbonate)	·698	8·256	·694	·966	·600
Magnesic carbonate	·289	·352	·636	·176	·201
Potash	·213	·228	·249	·188	·272
Soda		·166	·170	·274	·336
Chlorine	·011	·016	·025	·021	·041
Phosphoric anhydride	·061	·055	·047	·125	·051
Sulphuric anhydride	·055	·054	trace	·076	·022
Loss during analysis, &c. ...	...	·038	...	...	·070
	100·047	100·000	100·177	100·035	100·000
Salts soluble in water, chiefly alkaline salts and traces of calcium	·140	·130	·195	·140	·330
Reaction	neutral	slightly alkaline	slightly acid	slightly acid	slightly alkaline

Results of Mechanical Analysis of Soils from the Mallee Country.

100 parts air-dried contain of—	No. 1. Soil from Lake Hindmarsh, west of the Wimmera River.	No. 2. Soil from Pepper's Plains, ten miles east of Wimmera River.	No. 3. Soil from twelve miles west of Warracknabeal.	No. 4. Soil from Warracknabeal.	No. 5. Soil from Wyn-wyn run, north of Mount Arapiles.
Moisture driven off at 100° C. ...	2·354	6·004	4·360	3·671	4·466
Combustible matter and combined water	5·737	10·712	5·227	7·325	7·087
Gravel	·123	...	...	...	...
Gravelly sand	15·783	5·410	8·517	14·263	10·510
Coarse sand	59·833	51·795	52·274	53·693	58·310
Fine sand	3·809	18·907	2·700	3·941	3·424
Impalpable sand and clay ...	12·361	7·172	26·922	17·107	16·203
	100·000	100·000	100·000	100·000	100·000

These five samples were received by me from the Honorable the Minister, with instructions to analyze them and report. They were selected at the request of Mr. District Surveyor Madden by Messrs. Easton Johnstone and T. V. Breen, and were accompanied with specimens of the mallee foliage, timber, and roots.

The samples are apparently all somewhat coarse-grained sandy soils, and would be pronounced by any person unacquainted with the fact of their being samples of soil from the mallee country to be good, useful soils of a light character.

From an examination of the results of analysis given above, it is evident that, however similar in appearance these soils may be, it does not follow that they are so in reality. Sample No. 2, for instance, is a soil of an entirely different character from any of the others, containing a high percentage of calcic carbonate (carbonate of lime), and larger proportions of alumina and combustible matters. The other samples are sandy soils, differing from one another principally in the degree of pulverization of their particles, in the amount of combustible matter, and in that of the alkalies. Considering, however, the wide range of country over which these sandy soils extend, and the distance apart of the spots from which the samples were obtained, there is really a great similarity in their composition; they are soils of a like character.

These five samples were very small in quantity, and no information accompanied them. It was therefore impossible to form a correct opinion as to their probable value, without at least a knowledge of the depths from which they were taken, nature of the subsoil, and some idea of the conformation of the country, nature of the vegetation growing thereon, and so on. One or two of the samples had the appearance of having been scraped from off the surface, and analysis of such would have been worse than useless. I therefore communicated with Mr. District Surveyor Madden, who procured for me from Mr. Breen two samples of soil and two of subsoil, and the following reports from Messrs. Johnstone and Breen:—

"Sir, "Survey Camp, Warracknabeal.

"In reference to the memoranda in *re* mallee soil, which I have the honor to acknowledge, I would beg to say that each of the samples referred to was obtained from the surface, indeed almost scraped from it, at the roots of the scrub. The depth of soil which they represent would be, for Nos. 1, 2, 3, 4, respectively 5, 3, 2½, and 3 inches. They are all from comparatively level country, too high to have been subject to flooding at any time during the present configuration of the country. The nature of the subsoil would be better understood from the accompanying specimens—No. 6 subsoil representing the soil of No. 1 of the previous specimens, and No. 7 of the other soils.

"In regard to the specimens which I now send, I have the honor to report that they are from the extensive mallee lying east of the Wimmera River and of Lakes Hindmarsh and Albacutya, and extending thence by Lake Tyrrel to the Murray. No. 6 would represent the soil on the verges of the mallee where the country is good; the soil is from the surface to a depth of 4 inches, the underlie or subsoil being taken from a depth of 16 inches.

"No. 7 is the average soil of the general mallee country, which is at present of such little value for pastoral purposes. The soil is from the surface to 3 inches in depth, and the subsoil corresponding is from 12 inches below the surface. These were had some ten miles south-west of the intersection 142nd degree of longitude with the 36th degree of latitude.

"If this country were thrown open for selection, in areas of say 5,000 acres, at a lease of twelve or fifteen years, the rent being equivalent to the estimated assessment on its capabilities, the conditions being perhaps fencing, conserving water, and cutting and burning annually a stipulated number of acres of the mallee, I would venture to assert that it would cease to be the desolate waste it is at present. It should not be understood that every rood of this mallee country is overgrown with the scrub, but rather that it is interspersed with occasional plains and patches of open country, in which the lessee, having of course judiciously selected, would be able to grow sufficient hay for his own consumption, and collect and conserve rainfall for all his requirements.

"Sheep feed on the young mallee shoots as they spring up after burning, and the friable soil on which the mallee grows, when trampled on by the sheep, would be better consolidated, become more retentive of the rainfall, and capable of producing herbage, a fact which may be observed in the clearings made along the present mallee fences.

"If inducements were offered to selectors to clear a portion of their selections annually, at the expiration of the fifteen years a large area would be reclaimed, while the State would be making provisions for sheep-farmers with moderate capital.

"I have the honor to be, Sir,

"Your obedient servant,

"T. V. BREEN.

"W. Madden, Esq., District Surveyor, Horsham."

"Sir, "Natimuk.

"In reply to Mr. Ivey's questions, I beg to state I obtained my specimen about three miles north of Lake Wyn-wyn, county of Lowan; the depth of soil, similar to sample sent, was fully twelve inches; the subsoil of a marly nature, and not at all subject to be flooded at any season of the year.

"I may also state, for Mr. Ivey's information, that the soil sent was taken from the surface down twelve inches, but is not a fair specimen of the whole of the mallee country, as the barren sandy soil predominates; but, notwithstanding this, there are patches of as fine soil at the edges of the mallee, to all appearance, as ever were tilled; and my sample was procured from one of these patches, which in most instances do not reach one hundred acres in extent, surrounded by sandy heath or land abounding with ironstone pebbles; and where these pebbles are found the soil is never good.

"In conclusion, I beg to state that, if the mallee could be leased for a term of years at a mere nominal rental, the State would derive some benefit hereafter; but in its present state it is worthless, and will remain so for many years to come unless disposed of as suggested above.

"I have the honor to be, Sir,

"Your most obedient servant,

"EASTON JOHNSTONE.

"W. Madden, Esq., District Surveyor, Horsham."

Mr. Madden, in forwarding these reports, remarked that Mr. Breen's suggestion that certain portions of the mallee country be thrown open for selection in blocks of 5,000 acres in extent, on lease for twelve or fifteen years, subject to certain conditions, seemed to be a good one, and suggested that a few thousand acres might be so thrown open as an experiment.

It would appear from Mr. Breen's report that No. 6 of the fresh samples received represents the useful soil, and No. 7 the almost valueless soil of the mallee country. Analysis of these samples gave the following results:—

RESULTS OF CHEMICAL ANALYSIS OF SOILS AND SUBSOILS FROM THE MALLEE COUNTRY.

100 parts dried at 100° C. contain of—	No. 6. Sample of the better class Soils.	No. 6. Subsoil of No. 6 Soil from a depth of 16 inches.	No. 7. Sample of the poorer or more worthless class of Soils.	No. 7. Subsoil of No. 7 Soil from a depth of 12 inches.
Combustible matter and combined water (loss on ignition)	10·383	7·530	9·867	10·070
Silica and silicates insoluble in hot hydrochloric acid	77·712	72·748	54·755	70·450
Soluble silica	·035	·029	·209	·070
Oxides of iron (as ferric oxide)	2·522	6·903	4·654	4·731
Alumina	6·482	9·039	14·690	11·019
Calcium (calculated as carbonate)	1·814	1·268	13·379	1·087
Magnesic carbonate	·595	·856	·728	2·112
Potash	·201	·553	·662	·279
Soda	·338	·646	·606	·300
Chlorine	·013	·194	·106	·025
Phosphoric anhydride	·058	·067	·070	·043
Sulphuric anhydride	trace	trace	·055	·058
Loss during analysis, &c.	...	·167	·219	...
	100·153	100·000	100·000	100·244
Salts soluble in water, chiefly sodic chloride and sulphate, with but very small proportion of potassium salts	·124	·352	·400	·312
Reaction	...	alkaline	alkaline	alkaline

RESULTS OF MECHANICAL ANALYSIS OF SOILS AND SUBSOILS FROM THE MALLEE COUNTRY.

100 parts air-dried contain of—	No. 6. Sample of the better class of Soils.	No. 6. Subsoil of No. 6 soil from a depth of 16 inches.	No. 7. Sample of the more worthless class of Soils.	No. 7. Subsoil of No. 7 Soil from a depth of 12 inches.
Moisture driven off at 100° C.	4·552	8·920	9·890	9·050
Combustible matter and combined water ...	10·129	6·914	9·000	9·513
Gravel	...	...	...	...
Gravelly sand	8·233	11·540	3·880	8·866
Coarse sand	59·667	38·708	26·011	28·510
Fine sand	3·100	5·088	8·800	6·550
Impalpable sand and clay	14·319	28·830	42·419	37·511
	100·000	100·000	100·000	100·000

No. 6 sample is apparently a better soil than any of those previously forwarded, resembling No. 5 more than any of the others, the chief points of difference in this case being in the larger quantity of lime and finer division of particles in No. 6. The percentage of alkalies is nearly the same in each, but rather larger in No. 5, which sample was taken from the surface to a depth of twelve inches, whilst No. 6 represents the soil to a depth of four inches only. Nos. 3 and 4, which were taken to the depth of two and a half and three inches only, contain a smaller percentage of alkalies, whilst subsoil No. 6, from a depth of sixteen inches from the surface, yielded the high percentage of 1·2 of potash and soda, more than twice the amount found in ordinary soils. The same results were obtained by the determination of alkaline salts dissolved out by water alone. Whilst the amounts in Nos. 4 and 6 contain less than ·150 per cent., and No. 3 less than ·200 per cent. of alkaline salts, No. 5 contains ·330 per cent., and subsoil No. 6, ·352 per cent.—consisting in all cases chiefly of sodium salts, chloride and sulphate. It would appear from this, that, as a greater depth from the surface is reached, the larger becomes the amount of alkaline salts, and a larger percentage of sodium chloride (common salt) is found. The chlorine determinations also show this to be the case ; for whilst in Nos. 3, 4, and 6 the percentage is not higher than in ordinary soils, it is nearly doubled in No. 5, though still not very large, whilst in the subsoil No. 6 it reaches ·194 per cent., an amount quite abnormal in ordinary soils or subsoils. This would represent about ·325 per cent. of sodium chloride, a very large amount, though one not necessarily

injurious. The subsoil of No. 6, at a depth of sixteen inches, is the only sample containing this proportion of chlorides, the amount apparently decreasing until the surface is reached. There is no reason to suppose, therefore, that these salts would greatly affect grasses, except that they would probably be rendered short and fine in the blade, not great in bulk, but fattening—climate would, however, probably govern the growth of grasses and all else, and it must be stated that, where the amount of rainfall is small, the effects of saline matters in a soil are greatly increased. The roots of trees and shrubs penetrate to a greater depth than those of grasses (Gramineæ). The effect of the large amount of salts in the subsoils of the mallee country, increased as it would be by the deficient rainfall, may possibly account for the existence as a distinct species of that stunted eucalyptus which has given its trivial name to the extensive tract of country to the north-west of this colony.

Soil No. 2 and soil and subsoil No. 7 represent the soil of the almost worthless portion of the mallee country. The soil is light-colored and friable, its particles very finely divided. It contains a large percentage of lime and alkalies. The sample No. 2 differs from No. 7 considerably, due doubtless to its having been subjected to the effects of washing by rain-water. By this means it has lost much of the more finely divided portions of its substance, as the results of mechanical analysis show. One-third of the lime it probably originally contained, two-thirds of the magnesia, more than two-thirds of the alkalies (there being but one-seventh of the chlorides remaining) have been washed away, leaving coarse particles of sand to form a larger proportion of the bulk of the soil.

Subsoil No. 7 differs entirely from the soil lying above it. In appearance it is much darker in color, is coarser grained, and altogether has more of the appearance of a soil than a subsoil, when compared with soil No. 7. These two samples exhibit very distinctive features in the different proportions of lime, magnesia, alkalies, and chlorine, the soil containing an excess of these substances; generally they are found in larger quantity in the subsoil. Lime has an especial tendency to reach the lowest possible level in a soil; the alkalies (except when forming part of a double silicate) are washed out to some extent, and we should certainly expect to find chlorides less in quantity in surface soils through which we would suppose the rainfall percolated. The reverse is the case, in this instance, with all these substances. Not having any knowledge of the mallee country from inspection, I was desirous of obtaining more information respecting this soil, the

vegetation upon it, &c. In reply to my questions, I received, through Mr. District Surveyor Madden, the following further report from Mr. Breen :—

"Mr. Madden, "29th July 1875.

"I hasten to send you by the return mail from here the information respecting mallee samples requested by Mr. Ivey. As there may be the possibility of making a mistake in marking the previous samples, I have to-day procured others, which I now forward.

"A Nos. 1 and 2 are respectively the soil and subsoil from the same portion of Umber's selection, in Cannum, as they had been previously taken, which is good mallee country, being open and well grassed.

"B Nos. 1 and 2 are the soil and subsoil obtained from the Davis Plain meridian, about three miles south of Pepper Plains. These, like the previous Pepper Plains samples, would represent the general soil of the valueless mallee country, previously described by me. The soils are about three inches deep of the surface, and the subsoils are from fourteen inches below the surface. The samples B 1 and 2, 'meridian line,' were had from a clear little patch in the mallee on which neither mallee or herbage are now growing.

"Here it may not be out of place to remark that the soil is always less consolidated, and more friable and calcareous, at the immediate roots of the mallee scrub than in the open patches, and that from this I am inclined to think the mallee scrub has something to do with the large proportion of lime to be found in the surface soil. My theory is that the mallee roots open little fissures, forming as it were conduits for the rain-water to a lime substratum, which gets disintegrated, and finds its way to the surface in the same way as it does on the Murray Plain, where there are innumerable little calcareous blisters. However it may be, this is certain, that the elevated parts of the mallee country (excepting, perhaps, the sandstone ridges) contain the largest percentage of lime. The samples now forwarded are from country much higher than the surrounding plains, and if they had been at any time the bed of a lake, it was previous to the present formation.

"The soils of B 1 and 2, and of the previous No. 7, now produce very little but a small dense mallee scrub, and the ground is in no way similar to the desert or heath country which is chiefly sand.

"T. V. BREEN."

The samples of soil forwarded, marked B 1 and 2, are similar in appearance to those analysed, Nos. 7 soil and subsoil. It would appear that these soils are from land much higher than the surrounding plains, and that therefore the calcareous soil 7 was probably not deposited as a fine sediment from water. More certainly it has not been derived from its immediate subsoil and altered by atmospheric action or affected by that of water. That water, holding in solution calcium carbonate and alkaline salts, has, in this region of small rainfall, ascended from below by capillary attraction, and, upon being dissipated into vapor when reaching the surface, deposited these salts as they are now found,

is at least possible. The extreme fineness of the calcareous particles also favors such a theory, and it is extremely doubtful if any portion of the seven or eight inches of rain that annually falls in this locality ever penetrates beyond three or four inches from the surface. The amount of evaporation, on the other hand, from the surface of these plains must be enormous, and if, in the localities from whence these soils were taken, sinking should discover layers of limestone, the water being also more or less impregnated with salt, as I understand is the case in some parts of the mallee country, the above theory of the origin of this class of soil is probably not far removed from the truth.

I have, however, not sufficient data that I could advance in support of such a theory, nor can I venture to express an opinion as to the possible future value of these soils. They produce now only small mallee scrub, or are bare of scrub and herbage. If the above theory be correct, it is all but certain these soils will never be of value. If, on the other hand, the surface soil has been deposited from above, *i.e.*, is a sediment from water, it is quite possible that a deep ploughing, by exposing the subsoil—an earth of a very different character from that lying above it—would so improve the land as to make it equal in value to that from which sample No. 6 and others from "good mallee country" were taken.

It is probable that water conserved upon this land would be more or less brackish—much further information is, however, needed before a decided opinion could be expressed. The above suggestions are merely deductions from the results of analysis and from the reports of Messrs. Breen and Johnstone. It is quite possible they might be modified upon personal inspection of the country, and with the aid of some knowledge of underlying strata.

It would appear that the mallee country consists of land of three qualities, viz., the "useful mallee country," represented by samples Nos. 1, 3, 4, 5, and 6; the land from which samples Nos. 2 and 7 were obtained; and, lastly, the sandy desert. The value of the whole country for settlement would seem to depend upon the area of the "useful country" alone. Of the extent of this no information is available.

Limestones.

Seven samples have been examined. Three of these—two from Waratah Bay and one from Point Nepean—are almost pure carbonate of lime. The sample No. 5 is a nodular limestone, taken from a depth of 9 feet, where it forms a band of about 3 feet in thickness. It is similar

in composition to similar tertiary dolomitic limestones found in other countries. The following are the results of analysis :—

Results of Analysis of Limestones.

100 parts contain of—	Limestone from Waratah Bay.	An almost Black Limestone from Waratah Bay.	Limestone from Point Nepean.
Moisture driven off at 100° C.	·123	·055	·596
Loss on ignition	·556	·980	3·221
Silica and insoluble silicates	3·058	2·153	·280
Oxides of iron and alumina	·683	·669	·080
Calcic carbonate	94·438	95·397	95·343
Magnesic carbonate	...	...	...

100 parts contain of—	Nodular Limestone from near Timor.	Nodular Limestone from near Mortlake.	Limestone from the Duck Ponds surface Stone.	Limestone from the Duck Ponds from depth of 10 ft.
Moisture driven off at 100° C. ...	...	...	...	...
Loss on ignition	...	...	...	...
Silica and insoluble silicates ...	55·000	27·687	10·666	14·933
Oxides of iron and alumina ...	6·250	6·875	7·466	6·400
Calcic carbonate	29·187	57·125	67·066	64·400
Magnesic carbonate	6·142	5·292	7·257	5·040

Manures.

The systematic examination of manures offered to the agricultural community has suffered with other intended enquiries. But three samples of manure have been examined. Two of these are natural manures—viz., a kind of guano found on Duck Island, and used to some extent. The other is a manure that, at the present moment, is deserving of some attention, if only from its successful preparation seeming to offer a practical solution of the difficulty attendant upon the disposal of the Melbourne nightsoil. I allude to the so-called "Poudrette," the result of Messrs. Hesse and Rummel's process of treatment.

The Duck Island guano is a very useful manure, provided no distant carriage is necessary before it can be applied. It is evidently a mixture of the excretæ of birds (true guano) with sea sand and other matters. The guano having been deposited in a comparatively moist climate, the more soluble matters have been washed out, hence the small amount of ammonia and other alkalies. It is quarried out from where it is in position, and carried in boats. In its natural state it contains much moisture ; the samples analyzed were dry, and the value cannot therefore be given, except for them according to analysis, dried at 100° Centigrade.

The results of analysis are as follows:—

RESULTS OF ANALYSIS OF GUANO FROM DUCK ISLAND.

100 parts dried at 100° C. contain of—	No. 1 Sample.	No. 2 Sample.
Combustible matter	6·038	3·617
Sand	52·381	58·710
Ferric oxide	·920	·812
Phosphoric anhydride, 11·852, equal to tricalcic phosphate	25·092	23·255
Calcic carbonate	14·700	12·681
Sulphuric anhydride	·315	·200
Alumina	·430	·725
Alkalies, &c. (by diff.)	·124	
	100·000	100·000

"POUDRETTE."

This article differs essentially from the manure originally manufactured in Paris, and known as "Poudrette." The composition of different samples of this manure varies considerably, chiefly owing to different methods being adopted for the desiccation and deodorization of the nightsoil, from which the substance is manufactured. The sample under notice is free from earth and other valueless matters which were generally added for the purposes above mentioned before improved processes of manufacture were applied. I understand Messrs. Hesse and Rummel propose to drive off from the nightsoil, water, offensive and useless gases, such as sulphuretted hydrogen, by applying heat to retorts containing the crude substance. The residue is the poudrette. In this process ammonia is driven off by heat applied to the retorts. This ammonia is fixed by an acid through which the gases pass, and may be crystallized out and sold, or it may be added to the residue in the retort in any quantity that may be thought desirable. The sample analyzed is not, I am informed, of the best quality made, nor, as the works for this manufacture are not completed, can much be as yet said as to the value of this manure when made on a large scale. On these points I expect to be able to report more fully next year. The scheme seems feasible, and, if pecuniarily successful, will remove one of the great difficulties encountered just now by the metropolitan municipalities, and will provide farmers and market gardeners with a highly valuable fertilizer in a portable form. Although there is but little objectionable in the "poudrette," I think, where carriage of the article to a long distance by rail is necessary, an improvement of its

present form will be found to be desirable; but this is a matter of small difficulty, and will doubtless be seen to by the patentees when the more important work of starting the manufacture is accomplished.

The following are the results of analysis:—

"Poudrette"

Contains in 100 parts of—	
Moisture driven off at 100° C.	9·274
Combustible matters*	79·370
Sand	1·771
Phosphoric anhydride, 2·965, equal to tricalcic phosphate ...	6·472
Calcic carbonate	1·290
Alkaline salts (not determined), approximately by difference	1·823
	100·000

* Containing nitrogen, 3·635.

This is evidently a useful manure, and will prove a great boon to farmers and market gardeners if the manufacture be a success, and the product equal to the sample analyzed. I have but little doubt that there will be considerable difference in the values of samples at different periods. The percentage of nitrogen will vary considerably, and the true value of any quantity of the manure will be only known after the determination of the amount of this element.

As I think it important to the agricultural community that the value of such a manure should be recognized if ever available for use in quantity, I append a calculation showing the value per ton of manure equal to the sample analyzed, using a tariff of prices which I think fairly represents the value of the chief items—viz., nitrogen and compounds of phosphorous—in Melbourne.

One hundred tons of poudrette, equal to sample, would contain of—

—	Tons.	Value per ton.	Value in 100 tons.
		£ s. d.	£
Tricalcic phosphate	6,472	8 0 0	51,776
Nitrogen	3,635	80 0 0	290,800
Combustible matter	79,370	0 10 0	39,685
Alkaline salts (say)	1,823	1 0 0	1,823
			384,084

Or £3 16s. 9d. per ton.

Compared with the samples of bone-dust examined last year, which would average about £6 17s. 6d. per ton at same prices, it would appear

that two tons of poudrette would be at least equal in value to one ton of ground bones. The chief constituent of value, however, in this manure is the nitrogen; it is therefore a manure better suited for application to wheat and grasses than bone-dust. Were two adjacent portions of equal area of a field in wheat selected for experiment, and upon one portion two tons of poudrette applied, and on the other one ton of bone-dust, the superiority of the poudrette as a wheat manure would be readily seen.

This manure would be more fairly compared with Peruvian guano. Judging from its constituents, it might be expected that an application of from eleven to twelve hundredweight per acre upon wheat or grass land would equal in effect a dressing of three hundredweight per acre of an average sample of this guano, the most valuable fertilizer we possess. I have not seen any calculations of the patentees, nor am I aware what value they set upon this manure, nor whether the sample furnished me is above or below the average. No decided opinion can be expressed until the works are started and the article placed on the market in quantity. The above report is merely based upon the sample analyzed.

Determination of Tannic Acid in Barks.

This is an enquiry of minor importance, and yet likely to prove of value. Examination has only been made, so far, of acacia barks from some of the State forests, and of a few samples of barks of other plants. The vast difference in the quantities of tannic acid in the barks of acacias from different localities, and the consequent widely differing values of this article to the tanner, warrant a further and minute examination, which is now in progress.

Though but a few samples have been examined, enough has been done to point out the wide difference that exists in samples of even ordinary wattle bark. No doubt, tanners know that there is a great difference in the value for tanning purposes of bark from different acacias, but there is evidently a large margin for error where we find bark stripped from trees of the same species, but grown on soils of distinct natures, yielding such various amounts of tannic acid. The time of year at which bark-stripping is done must also affect the yield of tannic acid. This is not paid the least attention to in this country. I propose to continue this enquiry throughout the year. Many other specimens of bark have been obtained, but time for their examination has not been available. The few determinations that have been made have been here given for the purpose of pointing out a direction where

enquiry seems to be desirable, and not that much information can be derived from the scanty number presented.

The effects of soil and climate are forcibly illustrated in the case of the acacia with respect to the percentage of tannin contained in the barks grown in different districts. As far as these few determinations can be trusted, it appears that the volcanic mountain ranges are unfavorable to the production of tannic acid. The soils in which the trees from which the barks were obtained are growing have been in only a few cases analyzed. Deductions as to effect of soil upon the yield of tannin cannot therefore be made. There is no doubt that similar effects would be observed were other plants grown on these soils and under the different climates, examined, and the same causes would affect, in some manner or other, cultivated plants that might be grown on these lands were they occupied by the farmer. Hence such an examination is not only of value as showing the value of barks of different species of acacia, or of the same grown upon different kinds of soils, but is useful as showing the probable effect of such soils upon cereals, grasses, fodder plants, and indirectly upon stock fed thereon.

The following are the results of examination:—

Samples of bark of the following kinds of trees, dried at 100° C., contain of tannic acid as follows in 100 parts:—

Kind of Tree.	Part of Tree.	Place where obtained.	Soil.	Time of Year when Stripped.	Tannic Acid.
Acacia mollissima ..	Stem	Victoria State Forest ..	.. .. ..	March	14·364
„ „ ..	Branches	„ „ ..	.. .. ..	„	5·000
„ „ ..	Stem	„ „ ..	.. .. ..	„	5·330
„ „ ..	„	Dandenong State Forest	.. .. ..	„	18·880
„ pycnantha ..	„	Cape Otway State Forest	Clay	„	30·445
„ mollissima ..	„	„ „	„	„	21·100
Atherosperma moschata	„	Victoria State Forest ..	Porphyritic ..	„	3·110
Dais cotinifolia	„	Botanic Gardens ..	Sand (upper tertiary)	„	3·270
Pipturus propinquus ..	„	„ „ ..	„ „	„	7·550
Acacia mollissima ..	„	Bullarook State Forest	Clay (silurian) .	May	26·720
„ „ ..	„	„ „	Lighter soil ..	„	20·800
„ „ ..	„	„ „	Volcanic	„	16·800
„ „ ..	„	Langi Ghiran Reserve	Sandy (silurian) ..	„	27 470
„ pycnantha ..	„	Ararat Reserve ..	Silurian (ranges) ..	„	30·780
„ „ ..	„	„ „ ..	Silurian (flats) ..	„	23·680
„ „ ..	„	St. Arnaud	Silurian (ranges) ..	„	13·630

I have, &c.,

W. E. IVEY,

Chemist, Department of Agriculture.

A. R. Wallis, Esq.,

Secretary for Agriculture.

FOREST REPORT.

Sir,

I have the honor to submit my first Report upon the State Forests and other Timber Reserves of the colony.

This Report I have divided into four parts. In the first division I have included a short description of their present state, with a proposed new classification of these reserves. The second portion contains an account of what has been done since the State forests were placed under the control of this department. In the third I have shortly examined some of the peculiarities of the position occupied by national forests in this colony and their probable effects upon future forest management, and have made some suggestions with respect thereto. The fourth part deals with the forests seriatim, and contains a few remarks upon the State Nursery and the exhibition of specimens of timber at Melbourne and Philadelphia.

The Appendices to the Report are somewhat numerous and lengthy. I have thought it desirable to append reports on the condition of reserves received from forest officers. I have obtained, and also attach, as much statistical information as possible respecting the timber trade.

I.—Reserves for the Preservation and Growth of Timber.

their present condition.

The total area of these reserves is 1,155,664 acres. A list of them, with full particulars as to extent of each, date of reservation, &c., is given in Appendix X.

Many of these reserves have been gazetted as "State forests," others merely as "timber reserves," the latter being probably intended for the temporary supply of fuel and fencing to the surrounding population. There can be no line drawn between these two classes of reserves as far as their value for timber purposes is concerned, many of the so-called State forests being as bare of timber and as worthless for the purpose of a State forest as any "timber reserve" which may have been stripped of all the timber which once gave it a local value.

It is evident that the whole of the reserves should be re-classed, and the condition of each enquired into, before it can be decided what plan

of management should be adopted in each case. This enquiry has been made in the majority of instances, and reports giving full information are attached hereto.—(Appendices I. to VI. and IX.)

Many reserves are so denuded of timber, and present such small prospects of ever again producing a crop of trees, unless planted and conserved for many years at a cost totally incommensurate with the value of any returns they are likely to give, that it would be most advisable to at once revoke the proclamation of their reservation.

The rest might be classified as follows:—

1. "State Forests," which should comprise (*a*) "Eucalyptus Forests," (*b*) "Pine Forests."
2. Permanent timber reserves, comprising those reserves in the vicinity of mining centres and elsewhere, which it is intended to retain in perpetuity for the purpose of supplying fuel and the smaller descriptions of timber.
3. Temporary timber reserves, which will be disposed of so soon as the timber standing thereon has been consumed.

STATE FORESTS.

Reserves to be termed "State forests," which should be truly national forests, and in which a system of forestry can alone be carried out, should comply with the following conditions. They should comprise large areas of good soil, heavily timbered, which would, under proper management, yield sufficient timber to supply, without impoverishment, all demands upon them.

Of the whole of the reserves there are but few that would in all points tally with this definition of a State forest. Those that might probably be made to do so are the following, viz.:—

Names of Reserves.

Barmah,	Gunbower,	Grampians,
Moira,	Cape Otway,	Mount Cole,
Yielima,	Bullarook,	Victoria.

These may be termed reserves of the first class, being such as might with judicious management, and the addition, in some instances, of sufficient area of adjoining forest lands, be made first-class forests in perpetuity. The position of several of these has been well chosen, and, with such additions as it is yet possible to make in some instances, are likely to answer the definition of a State forest given above, which virtually means an area of timbered land capable of supplying all demands upon it from its annual produce alone.

In a new country it is not easy to err on the side of proclaiming too large an area of forest land, as it is always more difficult as settlement proceeds to extend than it is to diminish a reserve for any purpose. The estimation —even in a very general way—of the quantity of timber standing upon a given area of Australian forest takes time and a thorough knowledge of the country and of the particular kind of trees growing thereon. Still more is experience necessary before even the roughest estimate of the probable annual production of timber can be hazarded. The age at which all kinds of eucalyptus trees mature is still a moot point, and not until properly conducted experiments over large areas have been carried on for years can this question of the amount of timber likely to be grown annually in any forest be decided. For the present, the opinion of experienced men must suffice to guide us in this calculation. The extent of the demand, present and future, can be, as far as the future is concerned, only speculated upon, though estimates of the growth of population, the effects of the cost of carriage of timber from remote parts of the forest upon the demand for export or for other purposes, of possible competition with other forests or with timber brought beyond the sea, may be made with some show of usefulness in guiding the judgment in making the required reservations.

As an illustration of the direction enquiry into the capacity of a timber reserve to comply with the conditions named should take, it may be well to select the Murray River forests as those apparently most urgently requiring extension, and calculate roughly if by such extension of their boundaries as would include all available redgum country they can be established as State forests proper. The extent of these forests is about 134,000 acres. This area includes box rises of no value for timber, reed beds and lakes, as well as redgum flats or swamps of different qualities. The area of the redgum swamps, and even an approximative estimate of the timber growing thereon, it is almost impossible to give. From such data as I have been able to obtain, but which I am quite aware are open to cavil, though procured through admittedly good sources, and from my own observation, I would roughly estimate the number of useful redgum trees in these State forests at about 400,000, that would each yield on an average 700 feet super. of timber, = 280,000,000 superficial feet. The consumption of timber by the mills now at work may be estimated at 18,000,000 feet super. per annum. It would therefore take but little over fifteen years, at the present rate, to work out the whole of the timber in these forests. But to arrive at as correct an estimate as possible of the time these forests will last, there must, on the one hand, be added the timber procured from lands outside the forest

boundaries—notably from the banks of the Goulburn—and also the natural increase of the forests ; and, on the other hand, allowance must be made for increase of consumption. An estimate of any one of these items must be purely speculative ; but it is probable that the addition of the timber on the Goulburn River and other localities near Echuca, and the natural increase of the forests during fifteen years, would prolong the period for which the present State forests would afford a supply of timber to say twenty years.

No doubt much timber is procured a long way higher up the Murray than the present reserves extend ; and, making allowance for this, there is redgum enough to last for a longer period than that estimated as the probable duration of the State forests, which supposed that the demand for timber was concentrated upon them.

But if the Murray forests are to exist as State forests in perpetuity, it is absurd to attempt to maintain, as such, areas of land that contain but fifteen or even twenty years' supply at even present rates of demand.

The present areas should therefore be increased to the greatest possible extent. Even could they be doubled in area, and a forty years' supply of timber thus laid by, the period of forty years would be quite short enough to allow for the reproduction of such a crop per acre as is now being removed.

Mount Macedon and Dandenong reserves may also be included in the first class as State forests ; they are peculiarly situated ; are not of great value for the timber standing upon them ; but the position of either of them with respect to the metropolis is of the greatest importance, especially when considered in connection with the nature of the country comprised within its boundaries. Both are well adapted for conversion into pine forests, should it at any time be decided to establish such plantations.

PERMANENT TIMBER RESERVES.

The second class would comprise all those of the remaining reserves still in a condition to continue the supply of both the kinds and quantity of timber for the furnishing of which they were set apart, and which are so situated as to render advisable their being retained permanently for that purpose.

The admission of any reserve into this class must depend to a great extent upon the wishes of the people in its neighborhood, and upon its fitness to produce the class of timber required. In the majority of instances, the smaller reserves have been made for the purpose of supplying such ordinary timber as is required for firewood, fencing, and

for the minor requirements of miners, such as props, laths, slabs, &c., &c.

In most cases these reserves are upon a poor soil not calculated to produce timber fitted for more important uses. Many would, however, continue to produce a useful supply of timber fitted for the purposes above mentioned, if protected from indiscriminate cutting. Such as these might be retained, and could be easily selected by the persons most interested in their retention, whether selectors or miners.

TEMPORARY TIMBER RESERVES.

Reserves to be classed under this head are those made from time to time, generally in newly settled districts, for the purpose of supplying a demand for fencing timber and fuel. They are of small extent and of only local importance.

II.—Progress made in the State Forests.

The management of the forests having been so short a time under the department, and as it is only four months since officers were appointed to take charge of several of the larger reserves, there is but little to report under this head.

Previous to these appointments being made there were three men holding office as caretakers of State forests, stationed as follows:—

One in charge of Dandenong Forest,
One „ Cape Otway Forest,
One „ Victoria Forest.

Seven men were in February last appointed on probation for three months. Of these the five best fitted for the office of forester have been selected to take control of those reserves which it is proposed to establish as State forests.

The selection of these seven men was made, by a board composed of three officers of the department, from applicants for the office of Crown lands bailiff as well as for that of forester; the choice being made after a personal interview with all candidates who seemed from their applications and testimonials fitted to fill the office efficiently. The result, as far as can be anticipated at present, will be that several valuable officers will have been obtained for the carrying out of forest regulations.

The position of the foresters would be much improved if quarters were provided for them in the forests, for they would be enabled to exercise a more efficient supervision than is now possible.

On the newly appointed officers arriving at their respective stations, each received instructions to report fully upon all the timber reserves

in his neighborhood, a list of which, with plans, being forwarded to him. It was required that these reports should contain exact information as to the present condition of each reserve with respect to the timber standing thereon, the extent and nature of the cutting of timber, with statistics thereof, and upon all other points of interest the forester might deem worthy of being mentioned.

Reports upon nearly all the larger reserves have thus been obtained. These are appended, and will be referred to in another part of this report.

The officers were also instructed to prepare maps and tracings of the forests, showing the position and extent of each covered by timber of different ages and qualities, of saplings, &c. These, in some instances, are instructive, and in all cases will—combined with the reports—prove a good test of the ability of the officer compiling them for the position of forester.

The work these men are now chiefly engaged upon is the inspection of the present boundaries of the forests, with a view to the rectification thereof, the selection of natural boundaries, such as rivers, creeks, &c., where practicable; and the enlargement of the present areas where desirable.

All the reports received agree in stating that much unlicensed cutting of timber is practised in the forests. No action has, however, been taken as yet to summons offenders, it having been deemed sufficient to first warn all persons illegally at work, there having been previously almost total absence of control. These initiatory measures have been effective in considerably increasing the amount of revenue.

Should it, however, be found that men decline to take out the proper license after this first warning, vigorous and sufficient measures will be at once adopted to strictly enforce the law in this direction.

The forests the charge of which will be placed under foresters are are follows :—

1. Barmah, Moira, Yielima,
2. Gunbower,
3. Bullarook,
4. Cape Otway,
5. Macedon,
6. Dandenong,
7. Victoria.

III.—The Management of Victorian Forests.

It is generally admitted that the course to pursue with respect to both the present and future timber supply in this colony is not easily defined. In attempting to devise a practicable scheme for its regulation,

attention is naturally directed to older countries, but with poor results, for the circumstances surrounding forest matters in Victoria are radically different from those existing in any old settled country in which a proper system of forestry has been perfected. Nor have attempts to modify an approved system to suit Victorian requirements resulted satisfactorily. Therefore, it would seem easier to plan an entirely new scheme of management than to so extensively alter any one of the systems of Europe as to render it applicable or practically useful in this colony. Herein lies the difficulty in dealing with Victorian forests—the points to be taken into consideration are new; and, with no approved precedent to follow, schemes of management may be, and have been, devised and developed, time, thought, and much labor expended upon them—the result being the rejection of even those apparently the most promising.

The position of State forests in Europe is very different from that occupied by them in this colony. The points of divergence are several, and of radical importance. When planning a scheme of management for Victoria, and attempting to adapt any system in vogue in older countries, two points especially claim attention; first, the relative position in this and other countries of the State forests themselves; second, the relative position, in the forests under comparison, of the market price of standing timber with respect to that of the labor required to procure it and to prepare it for market.

THE RELATIVE POSITION OF STATE FORESTS IN DIFFERENT COUNTRIES.

Whilst in Europe State forests are treated as stores of timber to be farmed by the Government for the benefit of the whole community, in Australia and in America the primeval forests, whether reserved or unreserved, hold the position rather of timber commons over which rights of commonage are granted on payment of certain fees.

The great forests of continental Europe are either in the hands of Government or of large landed proprietors. The management, as far as general principles are concerned, is similar, and may be compared with that of the large plantations in Great Britain, which are almost invariably owned by private persons.

In all these cases the land producing timber is treated in a similar manner to land producing corn, or any other marketable product. The timber is sold either in position, or, after being cut, in the forest, or at the best market.

From the fact of the timber being cut and removed from the forests only by the officers of the Government, there is no difficulty in protecting the forests from spoliation, the officers thus employed being numerous, and certain portions only of the forest being laid under contribution for the required annual supply.

On the other hand, the position of the timber question in the United States of America appears to be somewhat similar to that occupied by it in Victoria, though the length of time during which similar practices to those obtaining here have been carried on has been so great that the inevitable results thereof are become painfully visible, and are, now that it is late in the day, exciting great attention and even anxiety in some quarters. As in America, so in Australia, has the same system of uncontrolled license held sway in the forests. Its existence is one of the difficulties in the way of bringing the national reserves of timber under control.

It is stated that in America the Eastern States are already becoming bared of timber, and draw their supplies from the north, whilst in the timbered lands, where a market is not near, the same practice of ringing or girdling trees prevails as upon similarly situated lands in Victoria :—

"The older portions of our country are, even now, drawing their supplies of lumber from the newer States. For black walnut, and some other woods used in cabinet manufactures and in carriage-building, the Eastern States are already sending to Michigan and Wisconsin, while tens of millions of dollars' worth of pine are brought about two thousand miles from our upper lakes and the head waters of the Mississippi to our Atlantic and Gulf seaboard. Foreign nations also are consumers of our forests. Oak and pine are exported by us to other countries for purposes of house and ship carpentry. A single gun factory in Europe, during the first two years of the rebellion, consumed 28,000 walnut trees to supply gun-stocks for the American market.

"In the State of New York alone, within the ten years from 1850 to 1860, there were brought under cultivation 1,967,433 acres of land hitherto unimproved. As there are scarcely any lands in the State of New York naturally untimbered, it is probable that during those ten years more than 1,500,000 acres of what had been (or was then) timbered land was cleared for purposes of lumber and agriculture. Thus 500 acres of land were changed from wood-bearing and timber-growing, each day, for 300 days each year, through that period of ten years, into farming lands.

"During the same ten years more than 50,000,000 of acres in our whole country were brought under cultivation. But these improvements were especially made in Iowa, Kansas, Minnesota, Wisconsin, Illinois, Indiana, Ohio, and Texas.

"In all regions remote from a market, and where logs and lumber cannot be readily exported, no matter how grand the forests, how excellent the timber, the trees are killed by girdling, and left to stand until overthrown by their own weight

or by storms, and are then consumed by fire, yielding in return for their displacement only ashes to act chemically upon the soil, the fire often injuring the earth itself far more than the value of the ashes returned.

"Millions of dollars are yearly paid for wood fuel, and the demand increases annually. Fully ten millions of dollars' worth of railroad sleepers are now annually called for by the railroads. More than one hundred millions of dollars' worth of sawed lumber is now consumed yearly, while the addition of timber for building and naval purposes, for home manufactures and cooperage, will probably swell the aggregate to $250,000,000 per annum. Such is the yearly destruction. Already the nation begins to feel the drain and the scarcity; and to counterbalance even in the least degree this waste, such experiments as we have urged should be set on foot without a day's delay."*

Thus, in the United States it is admitted that the consumption for railways and for all other purposes, and the destruction by settlers, are causing extensive inroads to be made into the timbered country, and although this is allowed, and the serious aspect of the case recognized, what has been done by the Legislature to meet the rapidly advancing scarcity of timber? Nothing whatever worthy of so great an interest! A few laws have been passed by several States, such as those to encourage the culture of forest trees on prairie lands; but there appears to be as much difficulty in dealing with this question in the United States as in this colony, and probably from similar causes.

In considering the supply of timber in Victoria, at first sight the quantity seems, as it once did in the United States, almost inexhaustible; but this aspect of the position of supply with respect to consumption is soon altered when it is ascertained what proportion of the timbered area is practicably inaccessible. The expense of bringing timber from the large tracts of forest land in the eastern portions of the country to Melbourne and other centres of consumption, would be far greater per ton, even with the aid of railways, than if brought a long sea voyage. Beyond a certain distance, timber cannot be carried by land and sold at a low rate. The extent of country carrying heavy timber that is favorably situated with respect to Melbourne, and which is likely to be rendered more accessible by railways, is not so large that there need be no anxiety for the future. Large areas do exist even within 70 to 100 miles of the metropolis; but if means of conveyance were available that their produce could be brought to Melbourne and sold at a fair price, the increase of consumption would be so enormous as to rapidly clear considerable tracts of country, whilst the progress of settlement will still more rapidly reduce the area of timbered land.

* Report of U.S. Department of Agriculture.

THE RELATIVE POSITION OF THE VALUE OF TIMBER WITH RESPECT TO THAT OF LABOR IN DIFFERENT COUNTRIES.

The second point mentioned no doubt is, together with the fact of the superabundance of timber in the early days of a new settlement, the cause of the great difference in the relative positions of the forests in new and old settled countries. And it follows that these positions will only be gradually assimilated as the circumstances surrounding the obtaining of timber and the supply thereof become more and more alike in the two countries, *i.e.*, when increasing scarcity in a new country forces the Government thereof to adopt the measures already, of necessity, taken in the older country to conserve the timber.

This period of comparative scarcity is already at hand in many of our goldfields towns, and its presence is felt even in Melbourne; for it matters little that an inexhaustible supply exists in the eastern portion of the colony, if cost of procuring it debars its use.

It may be worth while to briefly consider the position occupied by timber and labor in Europe and Victoria, and their relative value. In order to estimate the influence that the relation between the value of labor and that of timber in different countries has upon their systems of forestry, it is necessary to ascertain in each country—

(*a.*) The value of the indigenous timber as it stands in the forest.

(*b.*) The value of labor.

(*c.*) The relation the value of timber bears to that of labor—that is to say, the relation between the value of timber as it stands in the forest and that of worked timber.

In Europe the price of ordinary Scotch pine and larch timber of small size is from 8d. to 1s. per cubic foot, as it stands in the forest; felling, carting, &c., cost about 1½d. or 2d. per foot, leaving 6d. to 10d. per foot as the actual value of the timber itself in the market. This is for fir wood and ordinary larch. The value of hardwood is, of course, greatly in excess of this; but, as the position in European markets of hardwood and softwood is reversed in this country, it will answer the purpose so to compare them, although it is unfair to the best of our hardwoods that they should be placed on a level with the produce of the Scotch or spruce fir.

In Victoria the cost of balk timber delivered at the mill varies considerably, according to the distance it has to be transported and the nature of the country. Two shillings and sixpence per hundred feet super. may be reckoned as a fair estimate of the average cost of timber to the sawmiller, and will be close enough to the truth to illustrate the

point in question. The cost will therefore be about 3½d. per cubic foot, to compare with the price 6d. to 10d. per foot, the lowest price quoted for the poorest of European timber, and with the ordinary price of English oak, viz., 2s. 6d. to 3s. per foot. In making this comparison, it is not too much to advance that redgum timber approaches more nearly in intrinsic value English oak than Scotch fir. It will be needful to discover how much of the 3½d. per cubic foot is represented by the value of the tree as it stands, and how much by the cost of its removal to the mill.

For this purpose the sum received by the State for a tree must be taken as the value of that tree. It is virtually the price at which such tree is sold to the consumer, quite as much so as the 6d. to 10d. per foot received for his timber by the owner of a European forest. The sum paid in Victoria for felling a tree and sawing it into logs does not differ much in the several forests, 7s. per 1,000 feet super. on the Murray being nearly equivalent to 2s. 6d. or 3s. a log, which is about the price paid elsewhere, and is equal to a charge of 6s. to 10s. for the labor expended upon each tree felled.

A quarterly license to cut timber (a feller's license) costs 25s., and as 8s. a day is the least sum that a feller expects to earn, it is easily reckoned that not less than one tree is felled per diem by each man so employed, or seventy-two trees during the period of his license—if he work full time.

Each tree therefore costs—or need only cost—a licensee about 4d. The cost of the carriage of timber to the mill varies greatly, but may be calculated to amount to about 30s. for each tree, on an average. In many of our forests but few good trees really cost the miller less than 40s., delivered at his mill, and of this sum labor expended in cutting and carriage to the mill have absorbed the whole, except the fees paid to the Government for licenses. That is to say, that, instead of the value of the timber when delivered ready for conversion representing from five to twenty-five times the value of the labor expended upon it, as is the case in Europe, the position of the value is not only reversed in Victoria, but the cost to a licensee of the timber as it stood holds to the cost of the labor expended in getting it to the mill the absurd relative position : : 1 : 120.

Making allowance for loss of time, and also calculating the amount of license fees paid by the sawmiller for jinkers and tramways, the ratio, the cost of the timber as delivered at the mill, *i.e.*, the amount paid to the State, bears to the labor expended might be increased even to : : 1 : 40, which figures are quite sufficient to show the different positions held by timber and labor in Europe and Victoria.

The cost of the carriage of worked timber to market obviously must also seriously affect the value of the trees standing in our forests.

This item is necessarily large or small according to the distance of the mill from the market it supplies, and to the facilities for the carriage of produce. A wide margin must be left in estimating the amount of this item. From 3s. to 6s. per 100 feet super. may be fairly calculated as the cost of carriage—say an average of £2 for each tree. Adding this amount to that estimated as the cost of delivering a tree at the mill, it will be observed how small a proportion the apparent actual value of the timber, *i.e.*, the amount paid for it to the State, bears to the cost of the two items, labor expended in delivering it at the mill, and carriage of the worked timber to market.

The difference between the amount of these two items and the market value of the timber is the margin out of which the miller has to defray the cost of sawing, labor, wear and tear, &c., and to obtain his profit.

The miller's profit depends consequently in a great measure upon the position of his mill, but, *cæteris paribus*, is made up of two items—first, profit on the labor employed; second, the absolute value of the timber used.

It is in the fact that the latter item occupies such an anomalous position in this colony that the management of forests is rendered more than ordinarily difficult. It seems at first sight absurd that the State should give to a sawmiller for the paltry sum of £6 or £8 timber that at the mill itself realises £450 at least, and that the sawmiller's profit should, in a great degree, if not wholly, consist of the absolute real value of the standing timber, the property of the State. Here then is one great distinctive feature in the colonial timber trade, which, in its antagonism to the condition of the same business in Europe, would alone be sufficient to render the introduction of European systems of forestry, in their integrity, impracticable. In the one case the whole system is based upon the value of a cubic foot of timber as it stands in the forest, whilst in the colony this basis only exists as an item of calculation to the miller, to be taken into consideration when reckoning the cost of procuring the timber, converting it into the required forms, and placing it on the market. This item is here calculated as the miller's profit, and, where competition exists, may be absolutely absent or be represented only by the wages earned by the sawmiller in supervising the work carried on by the men in his employ.

This relative position of the value of timber and cost of labor is even more clearly seen in the case of splitters and men similarly employed in the forests, where the price of their produce in the market

is made up entirely of the two items—labor and carriage to market—*i.e.*, these men can only earn wages when the market price will leave a sufficient margin for that purpose over the cost of carriage.

The price of palings, posts and rails, &c., at the stump is sometimes but one-third, very often one-half, of that asked for the same article in the Melbourne and some other markets, and it is impossible to assert that any portion of the market value of these articles represents the value of the tree as it stands in the forest.

Much valuable timber is wasted also in consequence of its small first cost to persons using it, and of the disproportionately high price of labor; for where the value of a standing tree is to a licensee equal to but a fractional part of the cost of felling it, and where the cost of felling is equal to but a small portion of the cost of delivery at a mill, and that it costs as much to handle a decaying tree as a sound one, it is not to be expected that sawmillers will go to the expense of hauling to the mill an unsound tree when they can get a sound one that would yield many hundred feet more of timber for the small additional outlay of the cost of felling.

The same reasoning applies with even greater force in the case of the splitter, who, should he have felled a badly splitting tree, reckons whether it is more advantageous to work up the tree felled, or to fell another. In all such cases it is a simple matter of calculation of the value of the labor that must be expended that guides the sawmiller or splitter, the amount of the license fee being the same, whatever number of trees he may fell during the period for which his license gives him authority to cut timber.

SUGGESTIONS WITH RESPECT TO MANAGEMENT.

With respect to management in the immediate future, I beg to offer a few suggestions, premising that they must be considered as put forward as being calculated, in my opinion, to pave the way for the gradual introduction, as the country becomes prepared for its administration, of a thorough system of forestry. In the first place it will be necessary to classify all the reserves, to decide which are to be retained permanently, and for what purpose, *i.e.*, for the supply of what class of timber.

This done, and those reserves to be included in the first class, to be termed "State forests," having been selected, their capabilities estimated, and the quantity of timber that each could supply annually

without becoming gradually impoverished determined, it will be necessary to consider what methods will be best adapted for—

(1.) Control of the cutting of timber, and its restriction within the prescribed limits.

(2.) The prevention of waste of timber.

(3.) The protection of immature trees.

(4.) The reproduction of timber.

It is evident that should there be an excessive demand upon any forest for timber, the only way to protect it from destruction is to restrict the cutting within the proper bounds by preventing the cutting of more than a certain quantity of timber annually.

Perfect control over the timber supply would be obtained by selling just such a number of trees as the forests would yield without diminishing the stock of timber. Pending the general introduction of this system, cutting under license should be restricted to certain portions of the forests, and the number of licensees authorized to cut over any such portion should not be greater than would be sufficient to fell the amount of timber the forest is estimated to produce annually.

When such portion of a forest has been denuded of matured trees, it should be closed from all entry for, say, ten years, or longer, as might be determined, and another portion of untouched forest thrown open for cutting.

In Europe most of the difficulties we experience are obviated by cutting the timber and selling it outside the forest, or, if sold standing, each tree is marked, or the timber upon a specified area is sold outright.

To attempt to cut timber in Victoria for the supply of persons requiring it would be followed by certain failure, since, as I have shown, the market price of timber in any shape is, in general, but very little in excess of the labor expended upon it; and the cutting of a percentage of decaying trees would add considerably to the cost of the timber, and raise its price beyond the present cost to consumers, with no commensurate advantage to the State. The cost of cutting, per tree, would also probably be greater if done by the Government than if under the supervision of persons pecuniarily interested. Were the timber itself as it stands of a higher absolute value, the plan of cutting by the Government and holding periodical sales would be most advantageous. Under present circumstances, such a plan cannot be recommended as likely to answer in our forests.

The sale of the trees as they stand is certainly apparently the most promising method of dealing with timber, and would undoubtedly act as

a check upon waste, and should be gradually introduced into the State forests of Victoria in lieu of the present system. Its immediate introduction, however, presents considerable difficulties, chiefly connected with the absence of experienced officers in the colony to whom could be entrusted the carrying out of a system so radically different from that at present in existence. Even the adoption of this method would not at once prevent waste, as it would not be possible to make a purchaser use up a tree if he chose to abandon it. There would, however, be some check even from the first, and as the value of the trees increased, a purchaser, acting in his own interest, would not waste timber that he could profitably utilize.

The prevention of the waste of timber would appear to be an especial difficulty to be overcome in some of the more distant forests. The extent to which timber is destroyed in an Australian virgin forest, it may be observed, is often apparently greater than it is in reality, and a visitor familiar with European woods is very apt, on a first inspection, to estimate the waste to be much greater than is actually the case. Many trees in these primeval forests have arrived at maturity years since, and are now in different stages of decay, whilst in some forests the operations of wood-boring insects render valueless many apparently sound trees. These causes increase the apparent waste of timber. Still, making every allowance, there is great waste in all our forests.

Enforcing the using up of all trees felled can be carried out to a considerable extent, and will materially lessen this, but no measures that can be devised will at present ensure the complete utilization of timber, except in forests so close to a market that it will pay to use up inferior timber, and to carry for firewood top and lop and portions of trees valueless for other purposes.

The management of State forests in Victoria must ultimately be assimilated with that of European forests, and the sale of trees in blocks as they stand seems to be an almost necessary step towards a more perfect system. Its introduction, perhaps in one forest only, should be simultaneous with the institution of a small staff of trained officers, and its application gradually to other forests should take place only as experienced officers were available for carrying it out. Thus in time—supposing means of training forest officers provided—a thorough system of forestry might be established.

The present licensing system is susceptible of great improvement, and, by gradually bringing areas under better control, it might be used to pave the way for the introduction of a system better calculated to meet the requirements of the future.

The advantages of restricting cutting under license to certain areas may be stated to be—

(1.) The gradual and perfect clearing of the areas set apart of all fully matured trees.

(2.) The prevention of selecting the best trees for sawmill purposes throughout the whole forest, a practice known by the expression "picking the eyes out of the forest."

(3.) That growing trees could be easily protected upon the closed areas.

(4.) That general supervision would be less difficult.

Those forest trees are of the greatest value to the sawmiller which are in a healthy growing state, not fully matured, but which would improve greatly if left standing for some years. Such trees are picked out first wherever sawmillers' gangs start to work. Especially is this the case on the Murray, the river rendering accessible most of the forests on its banks.

By restricting cutting to certain localities, *all* matured trees would be cut, and there would cease to exist the present reprehensible and wasteful practice of taking a young growing tree and leaving a fully matured one (as not being quite so valuable for sawmill purposes). The result of this practice is that the matured tree becomes yearly of less value, and possibly of none by the time the part of the forest where it stands is again gone over, in consequence of the exhaustion of the previously untouched portion of the forest of choicer trees having rendered it necessary to accept trees of inferior value that had been before rejected.

An equally destructive practice which obtains in the forests would also be put an end to by the same means.

It is the custom at present for men to cut yearly over the same land, selecting young trees here and there as they arrive at a size at which they become valuable for working up. Trees are therefore cut just at the age at which they are making most wood, say from eighteen inches in diameter upwards.

There can be no doubt that immense benefits would result from the prevention of this cutting of immature trees over certain parts of the country, of which Barmah island may be cited as an instance.

UTILIZATION AND REPRODUCTION OF TIMBER.

Whatever plan of dealing with persons procuring timber may be adopted, but one system for the economic utilization of existing full-grown trees and of those arriving at maturity, for the protection and

conservation of the young trees, and for providing for the re-stocking of the forests, seems suited to the circumstances of Victorian forests.

We must rely upon natural reproduction, selecting the trees for felling as they arrive at maturity, and rendering every assistance, and affording sufficient protection, to nature in her efforts to restore our forests. It is true that forest land treated in this manner will not yield as much timber per acre as planted forest; but it cannot be disputed that, with cheap land and timber standing in the forest at such a low price, it would be unwise to attempt, at great cost, to convert our indigenous forests from natural forests into plantations. It would be better to devote a larger area of country to the supplying of our wants, employing a small portion of the labor that would be necessary to plant in putting in force vigorous preventive and protective measures, and thus conserve our timber supply.

The natural reproduction of forests presupposes the natural seeding of the land. In Victoria this natural seeding is quite sufficient in most forest lands, the exception being chiefly the volcanic mountain ranges. The apparent course of this is the rapid growth of the dense scrub to be found upon the volcanic soils.

The numerous seedlings that are found to follow a bush-fire show that it is rather the existence of the scrub that prevents the starting into life of the seed, than that no seed exists, or that such lands are unfitted to produce still another crop of timber. Nature requires assistance, however, in seeding the forests. Such assistance may take several forms, diverging even under various conditions in the same forest, and yet more so in the several forests of the colony.

The assistance to be rendered in this direction, though important, is neither difficult nor costly, and requires rather mere mention than discussion, it not being one of the difficulties of forest management in Victoria.

It has been already mentioned that by relying upon the natural reproduction of our forests we should require a larger acreage to produce a given result than if we undertook to replant the forests upon the most approved plan. It is also well known that the amount of good sound timber that an acre of primeval forest will yield is very small compared with that to be obtained from an acre of plantation. It does not, however, follow that, after a forest of indigenous timber is taken in hand, after the first cutting the yield is so much smaller than that from a plantation. Much of course depends upon the treatment of forest after the first cutting, at the time it is shut up to allow time for the maturing of growing trees and for re-stocking.

The difference in the state of the forest at the time of the second cutting from what it was when first entered is very marked.

In a primeval forest we have not only trees at maturity, but, as already described, trees in all stages of decay—the difference in age between the youngest and the oldest trees utilized at this time being very great, not less than fifty years. Calculating the whole of these trees, no doubt the proportion of useful timber is small. At the time of the second cutting all old trees of any value will have disappeared, and there will be a growth of young trees ready for the mill of nearly the same age and size. It will be so at each successive cutting, the later cuttings becoming more and more dependent upon the bestowal of proper care upon portions of the forest at the time of the periodic closing thereof.

That is to say, the crop of trees to be removed, say twenty-five or thirty years hence, will depend for its abundance in a great measure upon the action taken in the immediate future.

TREATMENT OF PERMANENT TIMBER RESERVES.

I have supposed reserves of the second class, "permanent timber reserves," to be such as are conveniently situated with respect to centres of population, and to be treated to the end that they shall supply fuel and other timber that will not bear the expense of carriage from a distance.

It is evident that the question of the supply of timber to those mining districts where the demand is greatest is one entirely of cost of carriage. Leaving out of the question altogether these timber reserves, those to be established as State forests are alone equal to supplying the wants of these districts from their annual produce of timber. It is not then a scarcity of timber in the colony, but the cost of carriage, that causes high prices.

The classes of timber the high price of which tells on the mining community are firewood, props and cap-pieces, slabs and laths, chiefly small, and mostly inferior timber. Heavy timber, and even framing and sawn slabbing for deep and permanent shafts, must, in a majority of cases, be procured from a distance, and in considering the case of the reserves in question need hardly be regarded, insomuch as for the next thirty years such timber will be procurable from no source at a less distance than that now supplying the demand.

Props and firewood can, however, be grown in a few years, and there are many reserves, besides those now containing valuable timber, which only require protection to yield, in a comparatively very short period,

both fuel and timber for inferior uses in sufficient quantity to meet such demands as exist at present.

It would appear desirable that, where it could be profitably done, the growth of these classes of inferior timber, which will not bear cost of carriage from a distance, should be encouraged, and that reserves should be retained in convenient situations for this purpose.

Were such reserves retained, if the end for which they are preserved be properly kept in view, the cost of attaining this object would be inconsiderable, nay, insignificant, beyond the cost of supervision and of any necessary fencing. In some cases, returns would amply pay for direct supervision and improvement; in others, the care of reserves should be given to officers having other duties to perform.

Whether the management of these reserves be undertaken by the Government or not is of little moment. The cost would probably be less were it essayed by existing shire and municipal councils already employing officers, who might be given the additional work of overlooking, protecting, &c., these reserves, receiving some increase of salary for so doing. Were the Government to undertake the work, officers specially appointed would be required.

IV. Remarks on the State Forests and other Timber Reserves.

The Barmah, Moira, and Yielima State Forests.

These forests were placed under the charge of Mr. Joseph Parker on the 8th of March last. The report of this officer is appended.—(Appendix I.)

I have myself inspected a considerable portion of these forests, and can endorse most of Mr. Parker's statements. From the statistics of the timber trade given in Appendix VI., it may be gathered how important this industry is on the Murray River. In dealing with these forests, I think it is absolutely necessary to restrict the cutting of timber to certain areas. Annually, or at intervals of three years, a certain portion of the forest, so many miles along the Murray River, should be thrown open, upon which portions only licenses to cut timber should be available. The destruction of the Murray pine which is alluded to by Mr. Parker should be at once stayed. Within State forest boundaries this tree will now be protected; but the proclamation protecting the pine is ignored by selectors, who appear to claim everywhere a right to timber for fencing and building; and the wholesale destruction of this tree has been hitherto permitted, whilst, on the other hand, the planting

of pines which yield a timber of no greater value—*e.g.*, Pinus insignis—is advocated. No doubt the cost of carriage prevents the Murray pine timber competing with superior kinds imported. The timber is, however, of particular value for inside work in parts of the country infested by the white ant, and will become of considerable importance. Selectors prefer this timber, because less labor is required to work it up. They should be restricted to the use of the eucalyptus. Should the area of State forests be increased as recommended, their large extent will tax the energies of the foresters in charge, and prevent their undertaking the proper conservation of the Murray pine outside their boundaries. As much as can be done in this direction will, however, be accomplished.

Upon making a calculation as to the probable quantity of redgum in the present reserves, and the amount of the annual reproduction of timber, and comparing with this the annual consumption by the mills at present in existence, I have come to the conclusion that, for the proper maintenance of these forests as State forests, their boundaries must be extended considerably. I have since requested the forester to give me an estimate—which can be but a mere approximation to the truth—of the number of the trees fit for sawmill purposes. His estimate is somewhat less than that already given by me ; but, adding annual increase, and making allowance for timber cut outside the forests, the results will fairly tally. The inference is that, as I have already shown, these forests should be doubled in extent if possible. With a view of obtaining a more thorough knowledge of the country that might be included as State forest, Mr. Parker has been instructed to inspect the country as far east as the junction of the Ovens River with the Murray.

THE GUNBOWER STATE FOREST.

This forest has been reported upon by Mr. Forester Dowling.—(*See* Appendix II.)

It is evident that no addition to this forest can be made, and it is therefore of the more importance that all available redgum country eastward of Echuca should be reserved. There has not been much cutting of timber done in this forest as yet, the preference having been naturally given to the forests higher up the Murray than the depôt for the timber trade—Echuca. The river current is thus taken advantage of to float the logs to the mills in Echuca, whilst all timber cut in the Gunbower Forest has to be towed by steamers against the stream to that place. So long as Echuca is the centre of the redgum trade, the position of Gunbower Forest must to some extent be prejudicial to the

value of the timber therein, although the quality of the trees is likely to almost neutralize this disadvantage, and an increased supply will doubtless be soon furnished from this part of the district.

The foresters in charge of both the Upper and Lower Murray Forests should be stationed in the forests themselves; and to this end it will be necessary to erect cottages, there being no accommodation available for quarters nearer than Echuca, unless the officers lived at the hotels existing in such places as Barmah, Turrumberry, &c., which I think is not desirable. They should rather have their own quarters in the forest, so that they may be able to keep aloof from all persons whose proceedings they have to supervise.

The sites for cottages will require careful selection, in consequence of the periodical flooding of the river. I would strongly recommend that this matter be taken in hand as soon as possible.

It will also be necessary that some arrangements be made with the sawmillers to allow of the foresters travelling by their steamers during the flood season.

THE BULLAROOK STATE FOREST.

Much consideration will be required when planning the future management of this forest, and the condition of large areas will necessitate close examination of present boundaries, with a view to their rectification.

Its condition was last year described by me (*see Report of Secretary for Agriculture*, 1874, page 79 *et seq.*). On inspection this year, I find the consumption of timber to be smaller than formerly. The demand for timber from the Ballarat district has very much fallen off; the rate of encroachment on the good portions of the forest is, in consequence, much slower in those parts from whence that district is supplied. The demand supplied from the north side of the forest is still active, much timber going northward by rail as far as Echuca, and some finds its way even to Deniliquin. Some demand for posts and rails has existed, chiefly for railway fences, otherwise the amount of splitting going on is not large.

A report by Mr. Chapman, the forester in charge, is given (Appendix III.). This does not give much information as to condition of parts of the forest with respect to timber, these particulars having been jotted down upon the map forwarded with the report. Statistics as complete as could be obtained are given.—(Appendix VI.)

I have not been able yet to come to any satisfactory conclusion as to the approximate quantity of timber in this forest. Cutting has been carried on in so many different directions, the quantity and quality of the timber vary so greatly in different parts, that it will take some more thorough examination on the part of the foresters and myself before I should feel justified in placing reliance on the figures supplied. Enough information has, however, been obtained from which one conclusion can be drawn, viz., that all land in the vicinity of the forest carrying good timber should be included within its boundaries. Although there is less cutting carried on, and the danger of the forest being cleared of all useful timber is not imminent, the demand is still sufficiently great to require the addition to the forest of all available timbered land, in order that it may be in a position to meet any increase of demand without injury.

Should a railway be made from Woodend to Daylesford, for instance, the demand would doubtless greatly increase.

The forester at present resides at Daylesford, which is too far from his work. A cottage should be erected in a central position in the forest, as there is no suitable accommodation to be had.

Much inconvenience has arisen from the number of illegal holdings in this forest, many persons having squatted down, built houses, fenced in and cultivated land in different places. Many of these persons had so settled down before the proclamation of the forest, and have petitioned the Honorable the Minister of Lands to legalize their occupation of the land which they had enclosed and improved. An enquiry into each case was ordered by the Minister. This enquiry was conducted by Mr. District Surveyor Chauncy, who recommended the excision of certain areas from the forest. A survey of the boundaries of the land to be excised was then undertaken and is now in progress. This survey will be extended to the whole of the boundaries of the forest. An extension of the forest to the south-east has also been recommended, in order to include a belt of fine timber in that direction. If this be included in the State forest, and the western boundary of the State forest proper removed east, say to the Werribee, a fine block of valuable timber will be comprised within these rectified boundaries.

The timber on the eastern portion of the forest, towards Macedon, is of little value except for firewood. A description thereof is included in a report on the Mount Macedon Forest by Mr. Bannerman, the officer in charge. He has been instructed to inspect and report as to the best natural boundaries for the forest to the eastward.

Mr. Chapman and Mr. Dowling have been instructed to do this work on the north, west, and south boundaries. If carefully and intelligently done, this work will be valuable, if only to allow of the boundaries being properly defined.

The heavily timbered portion of this forest has been divided by the sawmill owners amongst themselves, so far as having arrived at a mutual agreement not to interfere with certain areas apportioned to each. This division has to a great extent prevented the occurrence of sawmillers' rushes for timber, and the waste that thereon ensues.

This division of forest land has, of course, not been sanctioned by the department, nor does there appear to be any regulation respecting the distance that should be maintained between sawmills. Sawmillers assert, however, that they have been promised that no license for a mill site situated at a less distance than two miles from an existing mill shall be issued. Specifying the distance that should separate two mills was well enough so long as the men felling timber for each mill did not come into close proximity, but is not now sufficiently definite.

MOUNT MACEDON STATE FOREST.

This State forest must be considered from an entirely different point of view from all others, with the exception of that of Dandenong. During many years this forest has supplied vast quantities of timber to the Melbourne and local markets, and the result is that the supply is at length all but exhausted. The report of Mr. Bannerman, given in Appendix IV., describes the present condition of the forest. The future of this area is a question demanding early decision. If the restoration of the forest is to be undertaken, a considerable, though not extravagant, outlay must be incurred. It may be argued that expense should no more be incurred in this forest than in many others also denuded of timber; but irrespective of the question whether areas denuded years ago should be now taken in hand with a view of restoring them by planting at vast expense, as first-class forest lands, there are two reasons why Mount Macedon should be so treated.

First, because of its suitability for the experimental plantation of exotic forest trees, and also for the experimental raising and protecting of the eucalyptus.

Second, because the position of Mount Macedon with respect to Melbourne will always render it in some measure a sanatorium and place of resort for the inhabitants of the metropolis during the summer months.

On the latter grounds alone expenditure would be warranted on Mount Macedon that might be open to cavil if incurred elsewhere.

Should it ever be decided to systematically undertake the restoration of this forest, it will be necessary to decide whether it shall be restored as an eucalyptus forest, or whether attempts should be made to convert a portion of it at least into pine forest, as suggested in my paper "On the Planting of Exotic Forest Trees."

In either case a certain amount of expenditure would be required. Even were the sowing of eucalyptus seeds only to be done, some little clearing, fencing, and protection of the young trees from fire, by maintaining fire-strips and perhaps acacia belts, would be necessary. Land in such a position is too valuable to be allowed to suffer neglect.

The cost of planting exotic trees would be very considerable compared with that of the same work done in Europe, consequent on the difference in the price of labor, and the necessity of sufficiently clearing the land on the mount. Supposing, however, planting was undertaken to the extent of 1,000 acres per annum, as suggested, and the cost did reach £5 per acre, the aggregate cost would not be very great, and, if there be any truth in the figures given in my paper above mentioned, such cost is comparatively a small item.

The difficulties in the way are not great, though they have proved too much for the experiment made last year, which has been a failure, owing to the attacks of wallaby upon the young trees. The area then planted, fifteen acres, is now being more securely fenced, and will be replanted; but were persons living on the spot, as would be the case if large plantations were made, the wallaby would hardly frequent a spot where men and dogs were numerous.

Mr. Ferguson has been instructed to enclose and plant as much additional land this season as the means at his disposal will allow; but such means are not sufficient to do more than establish a small plantation and add to our knowledge of the cost at which the work of planting could be done.

Last year the experiment of planting exotic trees throughout the forest in open spaces was tried. Several hundred fine specimens of Pinus insignis were so planted; but unfortunately the bush-fires of last summer destroyed about three-fourths of them, and cattle, which seem to roam over this forest without hindrance, grazed upon the remainder.

Whatever plan be adopted for restoring forests in this country, bush-fires must be prevented, or confined within certain limits. These fires are seldom accidental. Settlers often set fire to the bush to protect their

fences, splitters to clear away the scrub to enable them more easily to procure timber, other persons to destroy the forest that they may have a better run for their cattle ; other fires again originate through a spirit of mischief in the incendiaries. Wilfully-caused fires are the rule in settled districts. It would not be of the slightest use to sow or plant trees on Mount Macedon unless measures were taken to protect them from fire.

Of course, were systematic planting undertaken, "fire-strips" of ample width would surround every block of plantation, and be kept clear of all accumulation of combustible matter. Any accidental fire would be thus confined to the block in which it originated.

Indiscriminate grazing should be at once put a stop to, and grazing cattle should be under the control of the forester, and confined to spots where no harm could be done.

To whatever extent planting may be done on the mount, some protection to the young trees will be necessary. It would be most advantageous to erect a cottage for the forester in charge on a selected spot. A central position could be chosen, that protection to the young plantation and supervision of the forest could be at once most conveniently undertaken. This position would naturally depend upon the extent of any proposed works. If nothing of any greater moment than is now being carried on, a site close to the present enclosure would answer. Should such site be chosen, it would be advisable to expend money on the repair of the road from Upper Macedon township. The road is now only practicable for pack horses, and is not safe even for them.

THE DANDENONG STATE FOREST.

The Dandenong Forest holds an analogous position to that at Mount Macedon, and much that has been said of the latter forest is applicable to it. It has been cleared of timber almost to an equal extent, is as much resorted to by visitors, and consists of similar rangy country. Very little timber cutting is now done, and there is so little change to note, that my report of last year upon its condition—(*see Report of Secretary for Agriculture*, 1874)—would require but the smallest additions to make it applicable for the present time. There are portions of this forest where reproduction of trees is going on satisfactorily ; but there are many upon the future prospects of which as forest land little favorable can be said, unless they be properly taken in hand, either with a view of re-stocking with eucalyptus or planting with coniferous trees.

To point out what might be done in this forest would be but to repeat what has been written when treating of that at Mount Macedon. The area available for such treatment is not so large as at Mount Macedon, although the area of the Dandenong Forest is more considerable. Besides those portions of the volcanic ranges growing fine young eucalyptus trees, and other more or less inaccessible portions still covered with heavy timber, there is a large extent of land to the north-east that is of no value for forest, and might be excised from the reserve with advantage. The boundaries of this forest in other parts also might be rectified, and more easily defined lines and natural boundaries substituted in many places.

At present this reserve cannot be viewed as a true national forest, however valuable an one it might be made. From its position with respect to the metropolis, the reserve is very valuable. Were any such work undertaken as suggested for Mount Macedon, the forester could be made of great use in superintending its direction, and in the future care and protection thereof.

The forester has been instructed to prepare land in suitable spots for planting exotic trees of different kinds, as even by planting a few hundred trees some knowledge of value for future guidance will be gained.

CAPE OTWAY STATE FOREST.

A report on this forest dated 17th November 1874 was furnished by me to the Honorable the Minister. I append extracts from it, as nothing of interest with respect to this forest has since transpired. Three applications for sawmill sites and for land for tramways near Apollo Bay have been received, but the applicants have taken no further steps in the matter so far as I am aware.

I have attempted, through the forester in charge, Jas. McGregor, to obtain such information respecting the northern and western boundary lines of the forest, that such might be improved; the country is, however, so difficult, that it seems impossible, without actual survey, to fix upon such rivers and other natural boundaries as would serve to mark clearly the limits of the reserved area. Some alterations will, however, be recommended in this as in most of the other forests.

There is not much timber cut within this forest, most procured in the neighborhood being obtained from Crown lands on the confines of the northern boundary. The forester in charge lives at Colac, and performs the duties of Crown lands bailiff for that district. Although his head-quarters are somewhat distant, I do not propose that he be removed into

the forest for the present, as the construction of the railway to Colac will very probably exercise considerable influence upon the timber trade in this locality. If it should be once shown that the cost of carriage of the bluegum of this forest does not prevent this timber from taking its place in the market in competition with that from other districts, the quality of the timber will soon create a demand that will necessitate greatly increased supervision.

There is no need of any calculation as to the number of years this forest is likely to last. It would be well if more sawmills were erected, in order that matured trees, now at their prime and likely to deteriorate, might be utilized.

THE VICTORIA STATE FOREST.

But little of interest in connection with this forest has lately transpired. About the usual amount of splitting has been carried on as heretofore. One sawmill license has been granted on the borders of the forest, near the base of Mount Juliet, and a manufactory for the purpose of converting certain kinds of undergrowth into axe-handles and articles of a similar character has been erected near Healesville.

The distance of this forest from the Melbourne market has prevented any vigorous prosecution of timber cutting, nor until communication is opened by rail, and the great cost of carriage by road reduced, is there likely to be any considerable extension of the operations now being carried on.

The stock of timber has been so little encroached upon that the undertaking systematically to replace trees where they have been thinned out, or are naturally sparse on the ground, is not urgent. There are many spots, however, suitable for sowing with eucalyptus seed, or planting experimentally with exotic trees, which might be taken in hand. The forester has been instructed to take measures for the commencement of such work, so that a few hundred trees may be planted this season.

Mr. Ferguson has lately visited this forest, and collected some fine specimens of the valuable woods growing so abundantly in this locality. These form the bulk of the collection to be exhibited at the Melbourne Exhibition, and will give some idea of the variety and quality of the timber to be obtained.

Any detailed report upon the present condition of this forest would be but a repetition of my report, page 69, *Report of Secretary for Agriculture*, 1874.

OTHER TIMBER RESERVES.

These will be dealt with under one head. Appended to this report are reports upon most of these reserves, the only exceptions of importance being—

(1.) Those reserves under the control of the Bendigo Woods and Forests Board.

(2.) The Mount Disappointment reserve, the watershed of the creeks supplying the Yan Yean reservoir, which is under the control of the Public Works Department.

(3.) Certain reserves lately made in newly settled districts.

(4.) Reserves made under the 52nd section of the Land Act 1869.

These reports were obtained with a view of possessing authentic descriptions of the condition of all timber reserves preparatory to deciding upon their future. With the aid of these reports and of local opinion it will be possible to classify reserves as suggested, to retain such as it may be shown to be desirable and advantageous so to do, and to reject others that do not promise to be of future value.

From these reports it will be readily seen that many of these reserves have served their purpose, and are now absolutely worthless as reserves for the supply or growth of timber. The soil is poor ; the original growth of trees having been almost entirely removed, and the first succeeding crop of seedlings burned, there is but small encouragement to undertake the restoration thereof as forest land, even were it pecuniarily advisable. Most of them are adjacent to mining centres. Some still afford a poor supply of firewood for mining purposes, whilst the better class of timber is obtained from a distance. It is mentioned in Mr. Dowling's report, Appendix VIII., that firewood costs in Clunes 30s. a cord, and is carted twenty-five miles. The same fact of great cost of timber is also true of other mining centres, and is represented by persons engaged therein as of vast consequence to the mining industry.

On the other hand, some of these reserves are large, and valuable for the timber they contain, in many instances only requiring proper supervision, care, and protection to supply the localities in which they are situate for an almost indefinite period.

Of the former class, a number could be at once removed from the list of timber reserves, those remaining being sufficient—if it were at any time decided to attempt to restore them—to supply the demands of the inhabitants in their vicinity, so soon as the timber trees sown or planted should have arrived at maturity.

THE STATE NURSERY.

The Superintendent's report contains full particulars of the work carried on during the past year, with an account of the expenditure incurred, both in the nursery itself and upon the experimental plantation at Upper Macedon. A list of the young trees raised is also given. The progress and present condition of these trees is satisfactory, and proves the position of the nursery to be well suited to its purpose.

The expenditure is no doubt large in proportion to the number of trees raised, but much of the labor the Superintendent reports to have been applied to breaking up and preparing new ground. This work is now completed, and for the future labor will only be expended upon nursery work proper.

The quantity of ground now available for growing young trees is large enough to produce annually a sufficient number of trees to plant a large area of forest land. Mr. Ferguson's list is of course but an enumeration and description of the produce of the nursery in its infancy, and the number of plants therein contained therefore small in proportion to that to be expected to be raised in future years. The nursery is now in good working order, and there is nothing to prevent its producing its full complement of young trees.

As we may expect in a year or two that the productive capacity of the nursery will be equal to producing trees for planting annually a considerable area of land, it is necessary that steps be taken for the formation of plantations in suitable places. I would recommend that such be commenced on Mount Macedon. I have already stated my reasons for selecting the mount for this purpose, and for advocating the formation of such plantations on a small or moderate scale.—(*See* my paper on "The Planting of Exotic Forest Trees.")

The laborers lately engaged in grubbing, trenching, &c., it is now proposed to employ in extending the experimental plantation of exotic trees at Upper Macedon. Mr. Ferguson has been instructed to that effect, and the work is now in progress.

This work should be next year continued on an increased scale, and during the following years should be carried on to the extent of the capacity of the nursery to supply the necessary trees. We should thus be able to plant out annually some hundreds of thousands of trees.

Exhibition of Specimens of Timber.

A collection of the useful kinds of timber growing in the forests will be shown at the Exhibitions to be held at Melbourne and Philadelphia.

It is to be regretted that notice of the requirements of the Commissioners could not have been made known earlier, so that seasoned specimens of woods could have been obtained and polished, and better opportunities afforded for the procuring of choice pieces of eucalyptus timber of large size. The specimens to be exhibited are chiefly of as large size as could be obtained from the different kinds of tree.

The following is a list of the specimens that will be exhibited :—

Eucalyptus rostrata (Redgum)
obliqua (Stringybark)
fissilis (Messmate)
goniocalyx (Swampgum)
globulus (Bluegum)
amygdalina (Whitegum)
leucoxylon (Ironbark)
Panax sambucifolia (Mountain Ash)
Hedycarya Cunninghami (Smooth Holly)
Coprosma microphylla (Native Currant)
Exocarpus cupressiformis (Native Cherry)
Banksia Australis (Honeysuckle)
Casuarina quadrivalvis (Drooping Sheoak)
leptoclada (Erect Sheoak)
Acacia melanoxylon (Blackwood)
mollissima (Black Wattle)
Callitris verrucosa (Murray Pine)
Prostanthera lasianthus
Atherosperma moschata (Sassafras)
Myrsine variabilis
Fagus Cunninghami (Australian Beech)
Pittosporum bicolor (Cheesewood)
Lomatia Fraserii (Holly)
Tasmannia aromatica (Pepper tree)
Bedfordia salicina (Cotton tree)
Personia arborea (Red Plumwood)
Notelæa ligustrina (White Plumwood)
Olearia argophylla (Musk)
Pomaderris apetala (Native Hazel)

Hereto are appended—

1. Report on the Murray Forests, by Mr. Forester Parker.
2. Report on the Gunbower Forest and the country west thereof, by Mr. Forester Dowling.
3. Report on the Bullarook Forest, by Mr. Forester Chapman.
4. Report on the Mount Macedon Forest, by Mr. Forester Bannerman.
5. Extracts from Report on the Cape Otway Forest.
6. Statistics of the Murray Forests.
7. Licenses issued during the year 1874.
8. Reports on Timber Reserves.
9. List of all reserves for the preservation and growth of timber, with area and date of *Gazette* notice.
10. Return showing the quantities, kinds, and value of timber imported during the ten years 1864–73, and the imports of timber during 1874.
11. Return showing the annual export and kind of timber the produce of the colony during the ten years 1864–73, the proportions to each country, and the value of such exports. Also the export of timber during 1874.
12. Return showing the exports of bark for the ten years 1864–73 and for 1874.

I have, &c.

W. E. IVEY.

A. R. Wallis, Esq.,
Secretary for Agriculture.

APPENDIX I.

Sir,

In accordance with the request contained in your memorandum of instructions of the 10th ultimo, I have the honor to report generally on the condition, &c., of the State and other forests throughout this district as follows :—

Barmah State Forest is bounded on the west and south by the River Murray, and on the north by the Murray and Lake Moira, and partially so on the east by a sandhill or bank, and is intersected by a few small unnamed creeks, flowing only during the winter months. Nearly the whole of the forest is flooded during the winter with from two to five feet of water, and the forest trees are, with a few exceptions, redgum. It is almost thoroughly culled of its best timber, there being at the present time only one small party of men falling trees for a local sawmill. The logs are towed down the Murray by means of barges, and are removed from the forest to the Murray during the flood season by pontoons.

There are many healthy patches of young trees and seedlings growing on this island that appear only to require time and the present annual natural inundation to bring them to the same dimensions as those trees that have now been turned to account.

Moira and Yielima State Forest is bounded on the south by a creek known as Smith's, not shown on the plan forwarded to me, and, like the Barmah, is intersected by several creeks which are natural outlets of the Murray, two of the principal of which are the Yielima and Budgaboni.

It is a fine forest, containing some large specimens of the redgum ; the maiden portion of it appears to be the part which lies between the eastern bank of the Budgaboni and the Boundary Creek, and better known as Upper Moira. This part of the forest, and for twenty miles east, is completely beset with men engaged in falling and removing logs. The young gums are very extensive throughout the forest, varying in thickness from six to fifteen inches at the butt. There are also numberless seedlings, which are densely thick, almost amounting to scrub.

Most of the logs, indeed nearly all of them in the back part of the forest, are removed to the Murray banks by pontoons; for this forest, like the Barmah, is under water during many months of the year. The young trees are more numerous here than on Barmah Island, and have a more promising appearance, attributable I think to the fact that they have a more durable supply of water than those on Barmah Island.

Gunbower State Forest is, comparatively speaking, a maiden forest, there being only one sawmill at work in it at the present time. The principal portion of the redgum timber extends from the junction of the Gunbower and Murray east to about four miles east of the Gunbower homestead, a distance by the Murray track of some forty miles.

The main bulk of the redgum extends along the Murray banks and south towards the Gunbower Creek some two to three miles, although there are several fine patches of this timber among the swamps adjoining the Gunbower Creek. The timber in this forest is very fine, if anything finer than that in the Moira and Yielima forest, and much more extensive. There is, I think, with prudent management, enough to supply several mills for many years to come. The young timber and seedlings appear healthy and strong, and in places are very dense.

This forest, like the other, is watered from the natural outflows of the Murray and Gunbower, and by the many swamps and minor creeks which intersect the island, many of which are seldom or ever dry.

There are but a few sandhills of any extent that contained fine samples of the Murray pine, but all those of any size have been destroyed by selectors. Some of the principal sandhills have been selected, I presume, prior to the forest being proclaimed a State forest.

There are few if any pines of any size left on the island.

A considerable portion of this forest consists of dry flats, densely timbered with grey box and acacias, of little or no value, except for fencing purposes.

With regard to the growth of redgum, I am sorry to say I am unable to speak with any degree of certainty on this subject, for the only information I have been able to obtain is from those parties who are engaged in the timber trade, and they, being mercantile speculators, take little or no interest in the growth of the trees.

The only information therefore that I have been able to glean, that is at all reliable, is from a man who has resided in the Moira and Yielima Forest for the last six years, and necessarily relates only to that forest. He states the most rapid instances of growth that have come under his notice he observed in that part of the forest to which I have just alluded, the part best supplied with water, viz., a running supply during seven or eight months of the year, and where the young trees are not too thick. In a few instances, in which he says he has watched with interest, the young trees have grown as much as 3 and 3½ inches in diameter in the space of five years, and he is of opinion that as the tree advances in age the growth is much more rapid. As a rule, I find the redgum prospers best in the swampy clay beds which are overflowed during six or seven months of the year, with a steady current of fresh water passing over them, for I notice that in nearly all the shallow lagoons that are covered with young gum trees which contain permanent and stagnant water the trees are dead. In short, I may state that the redgums prosper best in the watered swamps, the pines on the sandhills, and the box, acacias, and other trees of minor importance, on the dry loamy flats.

I am sorry to say I have as yet been unable to mark on the plans of the various forests the information required, from the fact that they are defective as regards particular or permanent land marks, especially so in the case of the Barmah, Moira, and Yielima Forests, which do not show the positions of Lake Moira, Kinnear's Island, nor even show or name Budgaboni, Yielima, and Boundary Creeks, the latter of which is known as Smith's. The tracings of the Gunbower is likewise deficient, for it does not show the position of the Gunbower pre-emptive right, nor that known as Dr. Ronan's homestead. I certainly could trace out the survey sectional numbers, but this would necessarily be a work of time, and would necessitate my residing on the island until completed.

Nearly the whole of my time has been taken up in hunting after the unlicensed occupants of the forest, the result of which has been I think an addition to the revenue of some £200 during the current quarter.

General Remarks.—I find that the size of the redgum trees used by the saw-mill owners varies from two to five feet in diameter; but few, if any, are used if at all unsound in the heart, so that in many instances trees are fallen which are slightly rotten in the centre, and are left to waste on the ground. I think some regulation or law should be put in force that would compel every one falling a tree to appropriate it in some way or other, and thus give room to the young tree

or trees to take its place. The land selectors are sometimes very slovenly in this respect, for they will fall a tree, cut one short log off, and, if too tough to split, will leave it and go to another, perhaps to be treated in a similar way.

They have made fearful havoc of the Murray pine, for which this district was famous ; in every place where pines could be found they have been cut indiscriminately, from a sapling three inches thick to the largest tree. Pine cutting was to within the last few days going on at a rapid pace along the southern banks of the Gunbower Creek. I found several parties removing saplings from near the Gunawarra station, and warned them not to touch another. There are a few sand-hills or ridges between the Swan Hill road and the Gunbower Creek, which contain some fine samples of young pine, that ought I think to be specially reserved as nurseries for these trees.

Some protective order for the preservation of all this class of trees should I think be issued with as little delay as possible, for, apart from their being highly ornamental, they will no doubt become of great commercial value. The farmers are, undoubtedly, the greatest destroyers of the pine ; and now that selection is extending rapidly along both sides of the Lower Loddon, north and west of Kerang, some very close and strict supervision should be kept over the various pine ridges in that locality, for there are some of the finest and largest samples of these trees that are to be found in the colony, some of the best ridges extending into the mallee, near to Swan Hill.

With regard to the question of the extension of the State and other forests, which you have alluded to in your letter of the 13th instant, I would recommend that the State forest of Moira and Yielima be extended from its present eastern boundary to the junction of the Murray and Ovens Rivers, a distance from the present boundary by the Murray track of about fifty miles. Most of the redgum timber grows on the banks of the Murray and in the swamps fed by it, which does not appear to extend more than two miles back. There has been a great deal of timber cut in this part, for there are now logs stacked all along the Murray banks from Tocumwall to Yarrawonga ; indeed, one of the local mill owners has now some fifteen hundred logs stacked at the latter place, which will be moved to the place of operation when the Murray rises. There is also a good deal of splitting going on in that locality.

I would wish also to inform you there are some fine redgum flats on the south side of the Gunbower Creek, immediately adjoining the Gunawarra pre-emptive right, on the north and south. This tract of country should, if possible, be included in the Gunbower State Forest, for selection is extending fast in this locality, and this forest will be encroached upon unless preserved by law. I cannot give the extent ; but I should say there are from two to three thousand acres.

While writing on this subject, I would call attention to the desirability of having all the unalienated Crown lands on both sides of the Goulburn River proclaimed and brought under the State forest regulations ; for this river, like the Murray, has many outlets or bywashes, which supply the many swamps and lagoons along its banks, the whole of which are covered with redgum of the best description, extending from its junction with the Murray to some twenty miles south of Shepparton.

There are now four sawmills in full work along its banks, and two more in course of erection. Such is the nature of the timber, that one of the local sawmill owners has cut and carried some hundreds of logs from a particular part of

the Goulburn to the Murray banks, a distance of nine miles, for he considered the timber to be of more commercial value than that from other localities.

As the back flows of the Murray during the flood seasons are the means of giving fresh strength to the young trees throughout the forest, I do not think that anything that would tend to check this supply should be permitted.

I have not been able to arrive at a correct estimate of the number of trees per acre suitable for milling purposes ; but, from the casual observations I have made, I consider the number to be about twenty to the acre.

Trusting that this my first report, although perhaps defective in many particulars, may in some way prove acceptable to the Forest Department,

I have, &c.,

JOSEPH PARKER, Forester.

W. E. Ivey, Esq.

APPENDIX II.

Sir, Echuca, 27th May 1875.

I have the honor to inform you that I have, according to instructions, inspected the Gunbower State Forest, and beg to report that this reserve is densely timbered with redgum, box, pine, and other trees of less value.

The forest is watered by the Murray River, the Gunbower Creek, and small creeks running from the river through the island.

The principal timber of value is redgum, which grows on the banks of the river and creek and in the numerous swamps of the forest. It flourishes best in the vicinity of the river, and in the swamps watered by it, and is, when found on dry flats, low and stunted in growth.

The main belt of redgum extends a distance of twenty miles along the river. It commences below the first boundary fence, and terminates at the intersection of the creek and the river. It runs south from two to three miles in the direction of the Gunbower Creek.

It contains magnificent young trees and seedlings, which appear healthy, and promise to stock the forest sufficiently well after the old trees have been removed. They are so dense that it was with difficulty I could ride through them.

These young trees vary in height from twenty to sixty feet, and range from six inches to eighteen inches in diameter.

The old trees are not so numerous, the average number fit for sawing being not more than six per acre. The remainder are used for fencing purposes.

The average number of young trees is, as near as I could ascertain, about forty to the acre. In some places I counted as many as eighty on an acre.

The greater part of the forest contains box and acacia trees, growing on the dry flats. In short, redgum grows in the watered country ; box, on the dry land ; and pines (of which there are few) on the sandhills or ridges.

The best box is now being rapidly removed by bushmen engaged by selectors in splitting posts and rails. There are several selections on the Murrabit River and the Swan Hill district. These selections are now being fenced by the timber obtained in this forest, which is taken down the river on rafts constructed for this purpose.

This box used for fencing can only be obtained in that part of the forest between the Murray River and Gunbower Creek on the east and the first boundary fence of the Turrumberry and Gunbower Stations.

I wish to specially bring under your notice the great destruction of this box timber by persons stripping the trees of their bark. It is used for building purposes. Also the destruction of young redgum trees and seedlings by fire. In the western portion of the forest there are about 3,000 acres of these trees and seedlings partially injured by fire, the younger seedlings being totally destroyed. This destruction is attributable to the great carelessness of bushmen, travellers, and others.

The average number of box trees to the acre is about twenty-five, the greater part of them being useless and only fit for firewood. Several men are employed in splitting them for firewood for the steamers on the river.

The only box seedlings worthy of notice are situated in the eastern portion of the reserve, and have, as I have been informed, sprung up during the last three years.

The pine trees are not numerous ; they have been removed by the proprietors of the mills, and are used principally for flooring boards and shelving when sawn. The young pines are small, and are almost all of the same diameter, viz., six inches.

There is but one sawmill in the forest. It is situated on the Murray, about the centre of the first-mentioned belt of redgum. The trees cut by it vary in diameter from two feet to five feet.

The timber, when sawn, is taken up the river to Echuca, by steamers, and is then forwarded by rail to Melbourne, for sale or exportation.

The mill is the property of Messrs. Blair and McGrouther. They employ in all twenty-five men, and the average number of trees cut daily throughout the year is eight. These trees are drawn to the mill by bullock teams, on what are termed buggies. They have four of these buggies, two of them only being in use at present.

I have also inspected the country west of the Gunbower State Forest, and beg to report that I followed the Murray River from the junction of the Gunbower Creek with the river to Swan Hill, and carefully examined the timber, its extent and quality.

There is but one belt of timber of any note, running a distance of eight miles along the river, beginning at the forest boundary and extending but half a mile south from the river.

The timber is of an inferior quality, being a species of dwarf gum, the straightest and best of it having long since been cut down by selectors for fencing, the trees remaining being unfit for any purpose save firewood. Posts seven feet long may, with difficulty, be obtained from them.

There are a few fine young trees growing along the river banks, but they do not extend any great distance from the western boundary of the Gunbower State Forest.

From the first-mentioned point, viz., eight miles from the forest boundary to the boundary fence of the Murrabit station, a distance of about six miles, the timber is of the same description, and does not grow beyond the bank of the river.

From the Murrabit fence to the junction of the Murray and Loddon Rivers there is scarcely a tree to be seen on the plains bordering the river.

On Pental Island, along the bank of what is termed the Big Murray, to distinguish it from the Loddon or Little Murray, there is a belt of redgum running half-way through the island along the river's edge, of the same description as that already alluded to.

From Pental Island to Swan Hill the plains border the river, there being not a tree observable.

The plains extend from the Gunbower Forest to Swan Hill parallel to the Murray, and vary in width from five to nine miles.

It is useless proclaiming any part of this country a State forest unless it be the intention of the department to reserve a frontage to the river for planting purposes.

Redgum will grow if planted in a low-lying country such as this, as I have observed a few belts of seedlings far out on the plain, where the seeds were deposited by the floods from the Murray River. One belt in particular I was informed has grown since the floods of 1870; the trees appear healthy, and vary in height from six feet to ten feet.

There are no creeks or streams that would form a boundary of a forest.

At any time the department may think fit to reserve any part of this country for forest purposes, I beg respectfully to suggest that two miles south from the river be reserved.

I have, &c.,

JOSEPH E. DOWLING, Forester.

W. E. Ivey, Esq., Melbourne.

APPENDIX III.

Sir, Daylesford, 10th May 1875.

I have the honor, according to instructions received, to submit the following report on the condition of the Bullarook State Forest under my charge.

I find that nearly all the forest west of the Ballan road is worked out for sawmill purposes, as shown by accompanying plan. The timber remaining consists of whitegum and messmate, and there is, in a portion which has escaped bush-fires, a fine growth of seedlings.

Saplings.—I find young saplings growing generally throughout the forest; it is the opinion of many that the whole of these will grow to be good, useful timber. With the exception of seedlings, I should say that it is a wrong impression. I would suggest that in no case should the cutting of seedlings be allowed, except by way of thinning. This applies more especially to the Moorabool flats, where it might be done by express permission, and under the supervision of the forester or deputy. I may here beg leave to mention that it is customary in England for the forester to mark all trees for the feller, so that those intended to be preserved are not cut down. This is only a suggestion, which would no doubt entail a considerable amount of extra labor.

The cutting of shoots and suckers might be allowed for props and scaffolding purposes, when of sufficient age.

The amount of remnants of trees felled by sawmill proprietors and splitters—such as butts and heads of trees—is enormous, and the means by which great fires are fed and such great ravages made. If some arrangement could be devised for burning them at certain seasons of the year, such wholesale destruction by fire as occurred last season might in a measure be avoided. There is no doubt that in the careless felling of trees many young ones are destroyed. I see no way of remedying this, as it would be almost an impossibility to prevent it.

Prop-cutting.—I have found very little prop-cutting, and this is confined to the boundaries of the forest. Parts of it should be set aside for this purpose, and special licenses issued, subject to the approval of the forester. To more effectually put a stop to the cutting of timber by unlicensed persons, greater power should be given to the local magistrate and the forester.

Splitters.—There are not many persons employed splitting. I have met some ten or twelve, most of them unlicensed.

Young Timber.—I find, unless ample power is given the forester, the cutting of young timber cannot be stopped. I have on several occasions met teams, both on the Malmsbury and Ballarat roads, loaded with young trees, and found stacks of telegraph poles on the roadside.

Firewood.—The greater portion of firewood got in this district is obtained from the lands of private individuals, the owner making a small trade by the sale of the timber, at the same time clearing the ground.

Valuable portions of Forest.—The most valuable portion of the forest for general purposes is in the neighborhood of Mr. Wheeler's mills, at the head of Anderson Brothers' tramway, thence over the divide to Mr. Blake's mill. With a few exceptions, the best timber is to be found about two miles on each side of the divide.

General View of Forest.—Taking a general view of the timber in the forest, I find that the best and most profitable to the sawmill proprietor and splitter is from two feet to three feet in diameter; exceeding that size, it is mostly destroyed by the white ant, worm-eaten, or hollow.

The best timber exceeding three feet in diameter I have seen is to be found in the neighborhood of Mr. Blake's mill, Korweingeboora Creek.

Classification of Timber.—It is very difficult to classify timber correctly. For instance, in going through a forest, one may come on a good belt of timber, and estimate it at twelve to fifteen good profitable trees to the acre, say twenty logs averaging sixteen feet; the next half mile one would perhaps come to a belt of whitegum in swampy ground—the consequence is, the timber is very small, although at maturity, and of no use except for splitting purposes. There is a considerable quantity of trees of this description throughout the Bullarook Forest.

Sawmills.—With the exception of two, Messrs. Blake and Wheeler's, the mills are working short-handed, on account of the dulness of trade and the falling off of mining throughout the districts.

I have, &c.,

CHAS. F. CHAPMAN, Forester.

W. E. Ivey, Esq.

SIR, Daylesford, 31st May 1875.

I have the honor to inform you that I have inspected the different parts of the forest as far eastward as Mount Bullancrook, and report as follows :—

The forest throughout the north side of the Dividing Range I find is more or less worked out by sawmill proprietors, &c.

The timber from Wheeler's Coliban mill to the Blue Mountain is very good, and almost virgin forest; of that thence to Southerton's mill, on the north side of the divide, it is very difficult to form a correct idea ; I have estimated it at five to ten trees per acre (good and sound). For instance, from Lyon's Blue Mountain mill to Macpherson's it would average about five trees to the acre ; and within a radius of two miles, Laver's to Christian's mill, thence to Southerton's, it would average about ten trees per acre (good and sound). I find, as in Bullarook West, that the timber of the best quality is on or about the Dividing Range ; what timber fit for sawmill purposes that is found elsewhere is in patches, and not in any quantity ; it mostly grows where there is a patch of good soil. I should recommend prop and telegraph pole cutting be allowed in this forest, which could be done without injury to young timber at present growing.

I have noted that throughout this part of the forest seedlings are comparatively scarce, the only exception is between Wheeler's Coliban and Lyon's Loddon mills ; there they are first class, and intermixed with blackwoods of a good quality.

Upon the south side of the Dividing Range, from Southerton's mill to Blackwood, the forest is composed of messmate and whitegums, and well stocked with good, useful timber for sawmill purposes. One disadvantage, the country is very rough, and almost inaccessible, on account of the very high ranges and deep gullies. In the winter months the roads are almost impassable; the result is that the mill proprietors are obliged to cut small logs, and stop work for the winter.

A great deal of the forest that is at present of very little use, such as trees that are refused by the sawmiller, &c., would be cut up into shingles and palings, should sufficient protection be given to the parties for their outlay in erecting shingle-mills ; it would not only give a small revenue, but be the means of clearing the forest of the apparently worthless timber.

I am of opinion that a great deal of the forest that is to all appearance worked out will be worked over again by the mill proprietors as the timber gets scarce.

The mill-power of this forest being small compared with that of Bullarook West, and the quantity of timber being nearly double, I should think this part of Bullarook will last for many years longer than the western part.

Attached hereto is tracing showing the different mills, &c. I should think, from information I have received, there are about 100 splitters engaged in this part of the forest.

I have, &c.,

CHAS. F. CHAPMAN, Forester.

W. E. Ivey, Esq.

APPENDIX IV.

Sir, Woodend, 4th May 1875.

Having recently been appointed to take charge of the Mount Macedon and part of the Bullarook State Forests, I have the honor now to submit to you a report on their present condition and future prospects, with some suggestions as to their management, in view of their being permanently devoted to the production of forest timber.

The district on and around Mount Macedon has, since the opening of the railways, been the principal seat of supply of sawn hardwood timber for the Melbourne, Castlemaine, and Sandhurst markets; the quantity of sawn hardwood turned out by the mills working from the Macedon State Forest alone having for a considerable number of years back averaged over eight millions of superficial feet annually; besides this large amount of sawn timber, vast quantities of posts and rails, and firewood, have been regularly sent to the Melbourne market. Having had to sustain such an attack, it is not to be wondered at, densely covered as Mount Macedon district formerly was with forest timber, that now baldness and bareness are in many places becoming apparent, and the near prospect of a total exhaustion of the present timber supply is being forced on our attention. Yet, great as has been the consumption by sawmills and splitters, it has of late years been nearly equalled by the destruction caused by fire, and through the anxiety of sawmill owners, each striving to secure as many good trees as possible, causing them to fall far more trees than they could possibly get through the mill before the summer sun and bush-fires rendered them unfit for such use. Some portions of the mountain have suffered more from fire than others, and are now nearly bare, having neither young timber nor old left, and in these tracts planting, so soon as the proper season arrives, should be at once commenced, and most extensively carried out. I am of opinion, from what I have seen of it in this colony, that the Tasmanian bluegum is the most suitable and most serviceable tree to plant; in about twenty years' time it will attain a diameter of about eighteen inches, and a height of from seventy to eighty feet; so that, if it is largely planted and well looked after, the forest in the course of nearly one generation might be restored. It is much to be regretted that the Crown has parted with so much forest land all round Mount Macedon—covered with fine timber, which the settlers, in most instances, seem only too anxious to destroy and get out of their way. Could it have been foreseen how soon the timber supply would become exhausted, I feel sure that, instead of reducing the forest to the small limits it at present contains, the whole mountain would have been retained by the Crown as a forest reserve. However, for the sake of generations to come, it is to be hoped that no more land will be taken from the forest, and that the best possible use will be made of what remains.

The crown of the high range facing Woodend, running along the western boundary of the Macedon State Forest, and on which the Government nursery is situated, is for the whole length nearly destitute of timber. As this range approaches Mount Diogenes, the timber gets better, though very much thinned out and nearly exhausted. Along the northern and eastern sides of Mount

Diogenes the timber is also very much thinned out, and on the plateau to the east of this mount, extending to the head of the Cockpit Creek, no large timber is left; but here the young timber has sprung up thickly and is now of good size, and, if protected, will in this quarter rapidly renew the forest. The Cockpit, so famed for the fine timber it contained, was the scene last summer of one of the fiercest fires that ever raged on the mountain, and the picture of desolation the upper portion of it now presents is most appalling, huge burned trees lying everywhere heaped up across one another, and hundreds of others burned to their topmost branches without a leaf on them, and apparently ready to fall with the slightest breath of wind. However, leaving this scene of desolation, and crossing the range to the eastward, we come on the Bolinda Creek and much better timber, though here, all along the head of this creek also, the fire has raged with great severity; but all down this creek, and especially on the granite range to the west of it, and extending the whole way from the foot of the Cockpit to Wooling, the timber is good and pretty plentiful; also all around the eastern boundary line of the forest, and round the foot of Mount Eliza and Mount Charlie, pretty fair timber still remains; but, with the exception of the spots I have named, Mount Macedon is entirely exhausted of good timber, and in the course of five or six years more, I believe, so far as mill timber is concerned, it will be worked out. The deep vegetable soil of the Mount Macedon State Forest, moistened as it is by innumerable springs, is really peculiarly adapted for forest planting, and the trees will make most rapid progress if trespassers can be kept from the portions planted, which, from the rangy nature of the country, can easily be done. I would recommend that a few panels of fencing be run from the range to the south-western corner of the mountain nursery, having a rough gate near the corner of the nursery fence; this would entirely close the south side of the mountain from trespassers; the only road leading to this side of the mountain left by the Government goes up there, and it at present is in so dangerous a condition that it is scarcely safe to ride a horse up, and is impassable at present for a dray. On the north-eastern corner of the forest, however, the same thing has been done; an inaccessible Government road running right up the face of the range has been left, and the natural and used track sold along with the land to various holders, and it is only by permission, for which he has to pay, that the mill owner can get his timber out to market.

The portion of the Bullarook State Forest placed under my charge extends from the western boundary of the Macedon State Forest along the course of the Main Dividing Range westerly to near the heads of the Campaspe and Saltwater Rivers, and southerly to near Mount Bullancrook. The eastern portion of this district, the tract of land running from Woodend to Middle Gully (Macedon), and bounded by the Mount Alexander road and the railway line, is especially valuable, as it contains a vast quantity of fine young timber, and having railway stations at each end, is really very conveniently situated for carriage; but to save this timber it will require to be fenced in; for such being done, however, it has the great advantage of the railway fence all along one side, and would therefore require only fencing along the Mount Alexander road. For about four miles westerly from here, the country is poor, bare, quartz ranges, with timber only fit for fire-wood; from there westerly to the ranges at the head of the Saltwater River, and thence northerly all along the Main Dividing Range, the timber is of good quality,

of fair size for mill purposes, and tolerably plentiful all the way up to Trentham. On the map sent herewith I have marked the position of the various sawmills, description of country, &c.

I have, &c.,

A. A. BANNERMAN, Forester.

W. E. Ivey, Esq.

APPENDIX V.

(Extracts from a Report on the Cape Otway State Forest.)

As Apollo Bay is the only outlet seaward for the timber of the Cape Otway Forest, its safety and convenience as a shipping port are points of great importance with respect to the value of the timber along the coast. The bay itself is a fine semicircular indentation of the coast, open to east and south-east, but well sheltered from the westerly winds, and from the south-west by Point Bunbury and a reef that runs out therefrom for a considerable distance. As a harbor, it is looked upon as perfectly safe during the prevailing westerly winds, and is used as a harbor of refuge during westerly gales by coasters, both steamers and sailing vessels, bound for the western ports. There is a sufficient depth of water over all parts, and if the jetties were reconstructed, it would appear that shipping timber could be carried on with perfect ease and safety, except during easterly to southerly winds, which are not of frequent occurrence.

Leaving Apollo Bay, the track to Cape Otway crosses the Barrum-barrum River at its mouth; and after passing the alienated land along its course westward, a wide expanse of open country is reached, which extends seaward, forming Point Hayley. This open country extends inland perhaps one and a half miles, and has an easterly aspect; but the soil is poor and covered with grass-trees as far as the higher portions of the low hill, where the grass-tree is succeeded by stunted eucalyptus and scrub. The height of these stunted eucalyptus trees varies from ten to twenty feet, and the alternation of patches of trees of this description, of scrub and of heath, extends over a gently undulating country nearly as far west as the Elliot River, where the aspect of the country changes to steep spurs and deep gullies, covered with magnificent bluegum, forming a bed of timber equal to anything in the forest.

The change from the low-sized timber and scrub to the fine grown trees in these gullies is very gradual, but very remarkable in so short a distance. The track, though nearly parallel with the coast line, leads into the heart of a bluegum forest, the trees of which could hardly be surpassed for shape and value. Not of extraordinary dimensions individually, the trees stand very closely together—their clean straight barrels in diameter from three to six feet, and growing without a branch to a great height. The value of bluegum forest of this quality can hardly be computated. In attempting to set a value upon it, the risk of shipment must be taken into consideration; but as such timber should compete with the redgum in the Melbourne market, the difference in the cost of carriage between

sea-borne and land-borne timber should surely be sufficient to afford a margin for all sea risks.

This belt of timbered country commences about four or four and a half miles from Apollo Bay, and extends westerly about four miles, as far as Blanket Creek. The timber is not equally good over the whole of this country, but in no part of it is there anything but high-class forest land; nor does there appear any extraordinary difficulty in working the greater portion of this tract.

As far as the Elliot the gradients are very favorable for the laying of tramways. From that point the country is broken, but at the worst there does not appear any necessity for the undertaking of such bridges and viaducts as have been constructed in other forests of the colony, in order to obtain an access to timbered land, of not one-fifth the value per acre.

Beyond the Blanket Creek open heathy country is again traversed inland of Blanket Bay. Here again the same alternation of scrubby eucalyptus, heath, and grass-tree, as exists east of the Elliot, is passed through until the Parker River is gained. Apparently this open country extends inland, in some places from one and a half to even two miles. The soil is very poor quartzose sand, and after much rain—as at the time it was travelled over—is very treacherous, and in places most unpleasant for horses, owing to the existence of the shells of old gnarled stumps and roots, which, alternating with deep squelching mud holes, formed by horse traffic in the quicksandy soil, causes the foothold to be most uncertain.

The soil of the open heathy country at the head of Blanket Bay is probably the worst along this portion of the coast, though none of the soil of any of the land which is not covered with good timber is of any value for cultivation purposes. As far as its retention within the forest is concerned, the coast line forms a well defined boundary at present, and that is all that can be said in favor of not excising this land, which is not of the slightest value for the purpose for which it is reserved. On the other hand, it is of equal value for occupation, and it is hardly conceivable that men could be found who would be willing to spend time and money on such country. To an agriculturist it seems absurd that people should agitate for the throwing open for selection of this land, which certainly is not worth the cost that would be incurred in surveying the new boundary line of the forest.

Were proper outlets from the true forest to the sea-board provided, it would be far better that this bare open land along the coast were excised from the State forest reserve; but as to do so would be of extremely doubtful benefit to any one, it would be surely unwise to saddle the administration of the forests with the cutting of a useless boundary line, when this forest possesses so good an one as the sea-coast. There could be no objection to the excision were the cost of survey and cutting of the new boundary line and outlets for timber paid by those persons now agitating for the throwing open for selection of this land, and who, it might be presumed, would flock down to Apollo Bay and peg out the land upon the day appointed.

Across the Parker River the appearance of the country changes; an open sandy tract much covered with rushes, in places thinly grassed, growing a few ragged sheoaks and gums, extends as far as Cape Otway itself, and beyond and inland a considerable distance.

The country along the coast to the east of Apollo Bay forms quite a contrast to that to the west. Here the spurs from the main range run down either quite to the beach, or so close to it as to leave but the narrowest margin of level land. In some places along the coast a narrow strip or terrace of land exists in a few places as much as ten chains in width. In others, there is absolutely no land between the abruptly terminating spur and the sea. At the mouths of the larger creeks exist perhaps the most extensive plots of land that are sufficiently level to be worth occupying. At the mouth of Skene's Creek there is such a plot, probably eighty acres in extent, if a low hill be included with the alluvial land along the creek; but this is an exceptional case. The next piece of any value lies near Cape Patton itself, a distance of seven miles from Skene's Creek. Intermediate between these, patches of ten or a dozen acres might be found; but, to obtain ten acres of level land, an inordinate length of coast frontage would be required, except in a very few instances.

The whole extent of moderately level land along this portion of the coast is but small, too small to be of any value to persons not gaining a livelihood in the forest; and it is probable that—were the whole coast line to Cape Patton thrown open for selection—not more than half a dozen selectors would each find a patch of land to settle down upon of greater extent than twenty or thirty acres, unless they included in their selection densely timbered and broken country.

It is true that where small plots of land do exist the soil is of good quality, in many cases not easily to be surpassed, differing in this very widely from the miserably poor soil of the open, heathy country to the west of the bay; and there is no doubt that to a man employed in procuring timber from the forest it would be most advantageous to be able to cultivate a few acres of this soil.

Like most good soils in forest lands, to bring such land as this into a proper state of cultivation would require labor, energy, and perseverance. Along the coast line there is first met a fringe of scrub, bearing evidence of having to withstand many a heavy blow from seaward. Then succeeds the usual belt of stunted eucalyptus, also showing in the distorted stems of the trees the nature of the winds they have to contend against. The trees in these coast belts stand very thickly together, and their roots form a perfect network of tough gnarled timber, to clear the land of which is an undertaking requiring some little pluck to commence.

Beyond this belt of twisted and distorted eucalyptus, which forms a breakwind for the more favored trees on the landward side of it, the timber rapidly improves in quality, though the bluegum does not reach its full growth till beyond the summit of the first seaward range.

In considering any proposal to clear off these belts of scrub and stunted trees that at present withstand the brunt of the sea winds and protect the more valuable timber inland, it is a question whether, for the sake of the very few acres of land that are available along this part of the coast, it would be advisable to allow these protecting belts to be removed. On their removal the fate of all the timber on the seaward side of the first range might be prophesied with certainty.

It has also lately been put forward that coast timber is sometimes a disadvantage in preventing the moisture from the sea reaching far inland. The Cape Otway Forest was pointed out as an instance, it being represented that the warm

moist westerly winds were by it to a great extent prevented carrying their moisture to the ranges in the centre of the colony. Whatever truth there may be in the argument should be put forward in favor of the existence of the Cape Otway Forest rather than against it. A glance at the map will show that the ranges here run nearly S.W. and N.E., the distance N.W. and S.E., which represents the real extent of obstruction offered by this forest to the westerly winds—and then chiefly to S.W. winds—is only about ten miles.

It is stated that great advantage has followed the establishment of forests, protecting from easterly and north-easterly winds. As the Cape Otway Forest extends along the coast S.W. and N.E. only, it exposes its length of about thirty-five miles as a protection to the country inland from the S.S.E. and E. winds, which are the winds that are most objectionable. Instead of this argument being levelled against the existence of the Cape Otway Forest, there is probably no forest in the colony in favor of which this same theory could so consistently be advanced.

The country through which the track to Mount Sabine passes does not offer a very promising prospect of a good passable road being opened between the coast and the interior, though there are no insurmountable obstacles to the opening up of an ordinary dray track. Some portions of the present track are sufficiently difficult, running up steep spurs, and being knee-deep in mud. The country on either hand along the whole route is very broken. To the left is the valley of the "Wild-dog Creek," a steep narrow gorge running parallel with the track, with numerous small feeders of a similar character to the main gully, more especially near the head of the creek, forming a very rugged country, utterly unfit for any purpose but that to which it is now devoted. The extent of even moderately level land in the valley of the "Wild-dog Creek" is too small to be worthy of notice.

On the right hand, to the eastward, the country is equally broken. The spurs here run generally more in an east and west direction for some distance, gradually trending to south of east, meeting the coast line, which here trends north-east, at almost a right angle.

There is no more appearance of any moderate extent of level land to the east than to the west. Along the whole line of the track the descent into the deep gullies is rapid, and there is no appearance of any land of value for occupation. The soil is, however, good generally, being a rich vegetable mould, lying upon a stiffish clay. This vegetable soil is somewhat thin on the more exposed spots on the tops of a few of the spurs, but, being in general protected from the washing effects of rain by the dense growth of trees and shrubs, there is everywhere a sufficient covering to the clayey subsoil.

If this natural covering of trees and shrubs were removed, and the soil exposed to the effects of the sun's rays, of rain and of wind, there would doubtless be very considerable deterioration in its quality ; and places now covered with rich vegetable mould would in a few years exhibit a poor hungry clay, which could only be made to recover its former value on being supplied from the growth, for many years, of such a crop of timber trees and undergrowth as it now supports, with a sufficient addition of refuse vegetable matter.

Of the timber of this forest no estimation approaching correctness could be made until the country is properly opened up. The bluegum is the prevailing tree,

and exists throughout the greater portion of the forest, of such quality as has been before described when speaking of that growing along the course of the Elliot River. The stringybark and messmate hold a secondary place ; the great bulk of the timber is made up of these kinds. Other sorts of eucalyptus, especially the ironbark, exist within the boundaries of the forest, but occupy a comparatively insignificant position relative to the immense extent of the forest covered by the species above mentioned. There must be also reckoned the extensive beds of blackwood in most of the gullies, and other trees of small relative bulk, the timber of which is of great use for many particular purposes. Of these trees the gullies also contain a good supply.

The whole of the country inland from the line nearest to the beach, along which the bluegum is found to exist, has evidently supported timber trees of similar quality throughout to those described, though bush-fires have destroyed the timber over many square miles. The extent of this destruction may be observed by carefully making use of every point along the tracks where an outlook over the lower ranges may be obtained. On either hand, from a point between five and six miles from the coast, most of the ranges are covered with immense white stems of dead trees, marking exactly the course and extent of the destroying agent. It may be said generally that the fire has swept over the whole of the country between the point mentioned and the Mount Sabine Trigonometrical Station, a distance of over six miles, though there are patches here and there which have escaped the strength of the fire, and upon which huge trees still stand. Upon most of the country so destroyed the young gums are growing thickly, though there are spots where there is too much scrub and too few young trees to satisfy one that there is a certainty of the old forests being reproduced without assistance.

The summit of Mount Sabine is the northern boundary of the course of this destructive fire. From here some idea of the amount of destruction can be obtained. The ranges to the east and to the west, and the country passed through to the south, have all been submitted to its ravages, whilst north of the east and west line there is no appearance of the effects of fire, but one great extent of magnificent forest. To the north of Mount Sabine the forest is equal to anything in the colony, probably inferior to parts of the Victoria Forest in the size of the trees, but of greater value, as growing the more valuable bluegum. Both the bluegum and the stringybark are in great perfection on this slope of the mount, and the forest here must become of immense value if protected from fire—as soon as communication is opened up with the settled parts of the colony. Very fine timber exists to the northern boundary of the forest and but little beyond, the trees rapidly deteriorating in size as the open heathy country and poor quartzose sandy soil south of Colac is approached. The approach to the forest from the north is not difficult. At present there are no roads beyond the roughest of bush tracks, and these run over a very soft treacherous soil. There is, however, no obstacle in the way of the construction of tramways to connect this grand forest with the line of railway now being constructed between Geelong and Colac ; the gradients are favorable the whole distance, and twenty miles of tramway should not discourage any company, when its construction would enable them to tap a supply of timber equal in quality and in accessibility to any in the colony, not even probably excepting the redgum of the Murray flats. The bringing into competition with

the produce of other forests of the supply of timber in this forest, both from the north side thereof by train and from Apollo Bay by sea, would go far to relieve the excessive demands made upon the resources of the midland parts of the colony.

In favor of the lasting qualities of bluegum timber under all conditions of exposure, a considerable amount of evidence may be collected from wherever this timber from the Cape Otway Forest has been used. In the forest itself felled timber is shown of all ages, from that cut in 1848 to that felled during the present year. Posts split in the earlier year mentioned, keys and other pieces of timber used in the construction of tramways by the old sawmill company, though exposed to the most destructive influences, are yet sound; so are also most of the piles of the old jetties erected twenty years since, though the trees used for this purpose were only saplings. Taking into consideration the quality of the bluegum timber, and the immense quantity existing within its boundaries, the Cape Otway Forest must undoubtedly be classed as one of the most valuable forests the colony possesses.

A feature of this forest is the great abundance of the blackwood. No other forest in the colony contains such a wealth of this valuable timber. The number and size of the trees in the gullies is surprising, though unfortunately, upon the large areas over which the fire has swept, the blackwoods are more or less destroyed, many that were not absolutely killed being of little value for their timber. Still, excluding these areas, the blackwood tree is to be found in numbers and perfection of growth not readily discoverable elsewhere, and the quality of the timber is undeniably good.

As usual in all the forests of the colony where there is unexceptionably good timber readily accessible, men do their best to destroy. The quantity of blackwood timber lying in the small valley to the northward of Apollo Bay, about one and a half to two miles inland, would surprise any one who was not familiar with the reckless destruction carried on by men cutting where there is no restraint and plenty of timber to pick from. Blackwood trees, two feet to three feet six inches in diameter, which would in Melbourne be worth something considerable, lie in numbers, one across the other, in this valley. Out of some of the logs cuts have been taken, from many not a foot of timber has been removed. Much of the timber lying here is even now quite sound, whilst in many cases it has been destroyed by the channelling operations of the larvæ of one of the wood-boring beetles.

APPENDIX VI.

STATISTICS CONNECTED WITH THE SAWMILL INTEREST IN THE ECHUCA DISTRICT, COLLECTED DURING MAY 1875.

Name of Owner of Mill.	Where Situated.	No. of Engines.	Total Horse-power.	Number of Men employed at Mills.	No. of Fallers.	No of Log-carriage Drivers.	No. of Men engaged with Steamers and Barges.	No. otherwise engaged.
Jas. McIntosh ..	On private property at Echuca	3	70	49	9	8	14	..
Blair and McGrouther	Two mills on Crown lands at Echuca and one in the Gunbower State Forest	3	80	75	12	9	14	..
Robt. Barbour ..	Cornella (on Crown land) ..	1	12	32	8	10	11	9
Edward Whitely ..	On private property at Echuca	1	12	19	6	2	11	..
Saml. Riddle.. ..	On private property at Echuca	1	10	17	..	..	3	..
Jas. Buxton	.. ..	..	..	..	15	4	..	17
Thomas Buzza ..	Crown lands at the Goulburn River	1	10	18	2	2	..	..
Totals.. ..	.. ..	10	194	210	52	35	53	26

Name of Owner of Mill.	Total No. of Men.	Total No. of Logs used at the Mills per week.	Average No. of Feet super. per Log.	Average Cost per Log delivered at the Mill.	Rate Paid per Log for cutting and preparing at the stump.	Total quantity of Timber Cut per week.	Remarks.
						ft. sup.	
Jas. McIntosh ..	80	100	1,000	24s.	5s. to 7s.	100,000	25 to 30 per cent. of total quantity of timber cut is allowed for waste. Sold or used as firewood.
Blair and McGrouther	110	110	1,000	18s. 6d.	5s. to 6s.	110,000	
Robt. Barbour ..	70	60	1,000	12s. 6d.	5s. to 6s.	60,000	
Edward Whitely ..	38	45	900	16s. 0d.	5s. to 6s.	40,500	
Saml. Riddle.. ..	20	40	1,000	22s. 0d.	..	40,000	Mr. Riddle's mill has not been regularly at work until lately.
Jas. Buxton	36	..	..	..	..	..	Contract faller for the above mill. Camp is now almost abandoned for the winter.
Thomas Buzza ..	22	50	950	20s. 0d.	5s. to 6s.	47,500	
Totals.. ..	376	405	..	..	..	398,000	

The average cost to the mill owner of preparing 100 feet super. is about	8s. 6d.
Local market value of same, from	12s. to 14s.
Melbourne market value of same, from	16s. to 19s.
Railway freight (*i.e.*, 18s. 2d. per ton of 30 cubic feet)	5s. 6d.
Number of men engaged in the forests other than those employed by sawmillers	52
Rates of wages—Ordinary laborers	40s. to 45s. per week.
Skilled ditto	8s. to 12s. per diem.

Statistics connected with the Sawmill Interest in the Bullarook Forest, collected during May 1875.

Name of Mill Owner.	Situation of Mill.	Horse-power of Engine.	No. of Hands employed at Mill.	No. of Hands employed moving Timber to Mill.	No. of Hands felling Timber.	Total No. of Hands employed.
Henderson and Co.	Stony Creek	35	10	7	2	19
Ditto	Telegraph Mill	25	7	2	1	10
Anderson Brothers	Barkstead	50	16	7	2	25
Fraser	Pinchgut Creek	30	7	2	2	11
Crawley and Co.	Spargo's Creek	20	..	..	..	..
Ditto	Devil's Creek	15	8	1	1	10
H. McGie	Moorabool River	20	6	1	1	8
H. Costin	..	25	5	1	1	7
E. Blake	Korweinguboora	40	12	5	2	19
Ditto	Ditto	20	9	2	2	13
J. H. Wheeler	Kangaroo Creek	40	15	7	3	25
Ditto	Coliban River	28	13	4	3	20
La Gerche and Dodd	Sailor's Creek	16	..	..	..	..
Jas. Lyon	Head waters of the Loddon	18	12	3	4	19
Ditto	Blue Mountain	16	10	1	2	13
Macpherson	Trent Creek	10	9	1	2	12
G. Laver	Dalacte	25	14	4	4	22
Christian	Axle Creek	18	15	7	4	26
Ditto	Still Creek	12	12	7	4	23
G. Southerton	Sardine Creek	6	7	2	1	10
Kerr	Saltwater Creek	15	9	3	4	16
	Totals	..	..	..	..	308
	Less numbers for Mills stopped work	..	..	..	..	61
	Number at present employed	..	..	..	..	247

Name of Mill Owner.	Length of Tramways in Miles.	No. of Jinkers.	Average No. of Feet per Log.	Average Cost per Tree delivered at Mill.	No. of Feet Cut per week (6-inch measurement).	Remarks.
Henderson and Co.	4¾	2	800 feet (6-inch measurement) per log. 1,350 " " per tree.	About 40s. per tree. " 24s. per log.	102,000	
Ditto	2¼	1			84,000	
Anderson Brothers	13	2			150,000	
Fraser	..	2			66,000	
Crawley and Co.	..	..			72,000	Stopped work for the winter.
Ditto	..	1			42,000	
H. McGie	..	1			60,000	
H. Costin	..	1			42,000	
E. Blake	..	5			108,000	
Ditto	..	2			72,000	
J. H. Wheeler	7¼	3			96,000	
Ditto	3	2			102,000	
La Gerche and Dodd	3½	..			66,000	
Jas. Lyon	3½	3			50,000	
Ditto	..	1			27,000	Stopped work.
Macpherson	..	1			22,000	Stopped work.
G. Laver	2	3			50,000	
Christian	..	6			40,000	Stopped work.
Ditto	..	6			46,000	
G. Southerton	..	1			18,000	Stopped work.
Kerr	4	2			35,000	
Totals	43¾	45	..	..	1,356,000	Total weekly produce of all [mills.
Less numbers for Mills stopped work		9	..	..	185,000	
					1,171,000	Total present produce of mills [at work.
Number at present employed		36	..	..	585,000	Total present produce in superficial feet per week.

STATISTICS CONNECTED WITH THE SAWMILL INTEREST IN THE MACEDON FOREST.
SAWMILLS CUTTING TIMBER FROM MACEDON FOREST.

Name of Sawmill Owners.	Mill Site.	Horse-power of Engine.	No. of Men employed at Mill.	No. of Men falling Timber.	No. of Men bringing Timber to Mill.	Total No.	No. of Jinkers.	Tramway.	Average quantity of Timber cut Monthly.
									ft. sup.
Treacy and O'Hare ..	Private land	12	5	1	1	7	1	..	50,000
Hill (now Quiggan) ..	State forest	10	8	2	3	13	2	..	80,000
Allan and Rowe ..	Private land	20	9	3	2	14	2	..	100,000
Vinicum's	Private land	8	6	1	1	8	1	..	60,000
Robt. Scott	Private land	25*	5	2	2	9	2	..	80,000
Patterson and Carnie, Cherokee Mill	State forest	20	14	2	2	11	2	..	100,000
Patterson and Carnie, Star Mill	State forest	12	8	2	2	12	2	¾ mile	80,000
Robertson	Private land	7* / 8	5	2	1	8	1	½ mile on private land	70,000
	Total ..	122	60	15	14	89	13	..	610,000

* Water-power.

APPENDIX VII.

LICENSES ISSUED DURING THE YEAR 1874.

	£	s.	d.
Sawmills	740	1	1
Tramways	241	14	6
Cutting and removing timber	3,638	0	3
Total	4,619	15	10

APPENDIX VIII.

REPORTS ON TIMBER RESERVES.

Mr. Forester Dowling reports as follows :—

EGLINTON AND CLUNES.

This forest I found to be entirely denuded of all kinds of large timber. Along the north-western boundary, from Brasaschi's selection to the north-eastern angle of the forest, there are but suckers and a few seedlings. The latter are from six months to two years old. They are all low and stunted in growth, which I attribute to the fact of there being no protection from the old timber, which I have already stated has been entirely removed.

The remaining portion of the forest is perfectly bare, and, in its present state, is of no service whatever to the district as regards timber for mining or other purposes, unless planted.

The timber in this forest consists of red and blue gum, box, and ironbark.

To illustrate the scarcity of timber in this district, the sum of 30s. per cord is now charged for firewood at Clunes; it has to be carted a distance of twenty-five miles.

Eglinton.

This reserve is almost entirely stripped, except the southern portion, viz., between Lamb's and Gifford's selections and that of Holden's on the eastern boundary, where there is an average of ten full-grown trees to the acre. The portion above alluded to comprises about 1,000 acres. On the other portions of the forest there are a few suckers and seedlings, which latter are low and stunted in growth, and will never come to maturity.

The trees on the southern portion alluded to are gnarled and crooked, and unfit for anything, except the branches for firewood.

The timber is ironbark on the ranges, and on the low ground redgum and box.

There are no sawmills in the neighborhood, nor much mining going on, and the timber is only used by farmers for firewood.

In order to make this forest of any service it will have to be planted.

Craigie.

The whole of the northern portion of this forest down to Sainsbury's selection resembles more a plain country than a forest, as all the timber has been removed, and there are now not more than three crooked worthless trees with a few distorted saplings to the acre.

The central portion is entirely denuded of trees and saplings, whilst the southern portion, viz., from Wright's and Gedde's selections to the reserve adjoining the Eglinton Forest, is interspersed with young trees and suckers. The former are from three to seven inches in diameter, and principally composed of redgum and box.

There are no sawmills, nor is there any great demand for timber for mining purposes. A number of young trees have been destroyed by farmers for fencing.

This reserve is of no avail, nor can ultimately become so, for the purposes of a State forest, unless planted.

Wareek.

This forest is in a much better condition than any other I have inspected, the trees being more numerous; but the quality of the timber is inferior. The best trees in the forest have all been cut down, those left being only fit for firewood.

Clunes, Majorca, Maryborough, Craigie, and Timor are supplied with wood from this reserve.

The timber is composed of red and blue gum, box, and ironbark, the latter principally found in the ranges.

The seedlings are numerous, and, were it not for their great destruction by bush-fires, would eventually stock the southern portion of this forest. Their ages vary from nine to twenty months. There is a great deal of worthless scrub growing from old roots and stumps.

A number of young trees are being cut down for props, and, as there is not more than one prop obtained from each, great destruction ensues. In every instance where I saw this occurring I cautioned the parties, informing them of their being illegally at work.

I consider the average number of old trees would be about thirty to the acre, and of the young twenty to the acre.

Unfortunately, about 1,000 acres of seedlings and young trees have been partially injured by fire.

The best and thickest of the timber is on the south and west portions of the reserve.

There are no sawmills in the district, as the timber is used principally for firewood, as before stated.

Havelock.

This forest is somewhat similar to that of Wareek, the average number of trees being twenty-five to the acre. They are only fit for firewood, and this reserve, as well as Wareek, supplies Chinaman's Flat, Timor, Maryborough, Majorca, and even Clunes, a distance of twenty-five miles, with firewood.

There are a number of men engaged in cutting wood, most of them being licensed. Those that I found unlicensed I cautioned.

The quality of the wood is of an inferior description. It is chiefly redgum and box, the former being much used for props. There are a few young trees in the northern portion of the forest, say on an average twenty-five to the acre, and seedlings about six to the acre.

In the southern portion of the forest there is an average of twenty old trees and about thirty young trees to the acre.

There are no sawmills in the district.

Maryborough and Bet Bet.

This forest, which has principally supplied the miners and inhabitants at Chinaman's Flat, Timor, Alma, Bet Bet, and Maryborough for the past fourteen years, is almost denuded of timber; in fact, what is left is scarcely fit for firewood, being principally composed of old dead limbs and logs.

The old trees now standing are gnarled and stunted, and average only about three to the acre.

There are a few young trees, and these are now being cut down by farmers and miners. There is an average of about fifteen young trees to the acre, the seedlings averaging about six to the acre.

The timber is redgum and box.

This forest, like those of Eglinton and Clunes, Eglinton, and Craigie, is interspersed with a number of suckers from old stumps, which are worthless.

There are no mills nor any men at work in the reserve now, whilst a few years back numbers of Italian woodcutters were employed.

This forest, to make it available, ought to be planted.

Mr. Rothery reports as follows:—

Ballyrogan, No. 1.

This reserve, as shown upon plan, is fenced all round, being subdivided into four allotments. It is very lightly timbered with box and sheoak and a few whitegums. On three of the allotments there has been some cultivation; about eight acres on each.

Ballyrogan, No. 2.

This reserve is fenced in from the east, with a gate for ingress and egress, as also one from the north; no fence towards the west. The timber growing upon it consists of stringybark and box, only fit for firewood. There is a great quantity of dead timber lying upon the ground, the reserve being apparently very little used.

Langi Ghiran.

The railway runs through a portion of this reserve. A small portion of about 100 acres has been selected by Mr. Fay, adjacent to the main road to Ararat. The house erected upon it is let to a tenant, and the whole of the selection is enclosed with a brush fence. The reserve towards the north is very flat country, and the timber that is growing upon it is stunted box, and a few redgums just under the hills. Up the hill sides there are some excellent whitegums and lightwood trees, and over the hill towards the east there are some excellent stringybarks and whitegum; as also some splendid young timber, composed of messmate, whitegum, stringybark, and wattle trees, as also a few lightwood trees; a very great quantity of dead timber is lying upon the ground on the east side of the mount.

No sawmills at work at the present time, nor any splitters in the reserve; a great number of railway laborers are residing upon the reserve temporarily.

Langi Logan.

This reserve is fenced on the east side from the Hopkins River, and also on the north side; the remainder is bounded by the river. The timber growing upon it is stunted box and redgum, only fit for firewood. There is one house upon it, occupied by a boundary-rider.

Lexington.

This reserve is fenced all round with a brush fence; gates for ingress and egress. No persons living upon it, nor any persons engaged splitting or cutting firewood. The timber growing upon it is chiefly box, whitegum, redgum, and stringybark; nearly the whole of the sheoaks have been cut for food for cattle, and the dead timber left lying upon the ground. A very large number of cattle were grazing upon it. The young timber growing is chiefly box; the wattle trees have been denuded of bark.

Ararat Reserve, containing 1,800 Acres.

This reserve on the south is open country. The timber growing upon it is chiefly box and redgum, and a large quantity of wattle; on the north the timber is chiefly stringybark and box. There are several selectors living on the reserve, viz., McKay, 43 acres; Terence Sweeney, 88 acres; Patrick Sweeney, 80 acres; Pearbox, 20 acres; Michael Nolan, 70 acres; Henry Eaton, 54 acres; Pierce Welsh, about 10 acres, with his dwelling-house upon it; also 20 acres occupied by Welsh, selected by Darkas; and land occupied by and selected by Thos. Hayes.

Ararat Reserve, containing 3,560 Acres.

This reserve is upon the high hills, and the timber growing upon it consists of stunted box, only fit for firewood. There are a few gullies running from the hill, where there are some splendid young gums and box trees growing.

Ararat Reserve, containing 6,000 Acres.

This reserve has been largely used for firewood. Nearly the whole of the low-lying ground is covered with young whitegums, stringybark, and box; and on the hills whitegums, box, and stringybark, fit only for firewood. Some fine young trees growing upon the hills. There has been a great destruction of young timber in this reserve by being cut down for the purpose of making a new brush fence, the old one having been destroyed by bush-fire. There is a large quantity of black wattle growing upon this reserve, the majority of the larger trees have been destroyed by being denuded of their bark. There are two selections on this reserve, viz., Mr. Tuson holds 20 acres, selected by J. W. Booth; and Mr. Lamont, 20 acres, selected by Wathin. There is an entrance to this forest from the Avoca road by a slip panel; but on the Stawell road it is nearly all open country. There are a number of railway laborers living on the reserve.

Ararat and Dunneworthy Reserve, 4,100 Acres.

This reserve at the present time is chiefly used by the woodcarters who supply Ararat with firewood; it has been used by the sawmillers heretofore, but the old sites are deserted, and the timber growing upon it at the present time—that is, the large timber—is only fit for firewood. There is some fine young timber growing upon it, consisting of redgum, whitegum, box, and stringybark. Nearly the whole of the large wattles have been barked, the land in the reserve being at the present time grazed by sheep.

Mount Cole Forest.

This forest is at the present time chiefly used by mill proprietors. On the flats surrounding the hills redgum abounds, but in the heart of the forest messmate and whitegum predominate. From Mount Cole township towards Clunas's far mill, the timber is really excellent; but the difficulty experienced in getting the logs to the mill, owing to the steepness of the hills, makes the timber not so valuable as if it was on level country. There are some enormous trees growing on the ranges, and the gullies and ranges abound with young timber that will eventually become very valuable. From Clunas's to Philipson's the country gets more level, and his mill is situated in a splendid belt of timber; thence to Tunbridge's the first three miles is all up hill to the top of the Pyrenees; thence towards Tunbridge's the timber is grand, as straight as a gun barrel, but the expense of getting the timber down from the high hills precludes the great destruction that would take place. Mr. Tunbridge's mill is on his own private property. He has no work at the present time; there being no demand for timber, he expects that he will have to lie idle during the winter months. The bush-fire of last summer destroyed property to the amount of £400, and he has had to erect new machinery in consequence. From Tunbridge's to Cotty's it is all up-hill work, as they are situated on the top of the hill very near to Mount Cole hill. The timber is chiefly messmate, and of excellent quality. From thence towards Buangor the timber is very good, but apparently not much used, owing to the difficulty experienced in getting the timber to market, and its being not much in demand at the present time. A very large number of sheep are running upon this reserve. I understand that Mr. Paget holds 320 acres, as also Mr. Orr has some land fenced near Shepherd's Creek; and that Mr. Humphreys has about 40 acres on the reserve on the Middle Creek, on the south portion of the State forest.

Mr. Bowie reports as follows :—

THE GRAMPIANS.

I will first report upon the old portion of the forest to the north of Hall's Gap, and extending about two miles after passing into the gap.

The soil is of a light nature, some of it being very sandy. In fact, throughout the whole of the level country it is a sandy loam.

Along the north boundary, for about four miles, the timber consists principally of redgum, of very good quality ; which timber runs south about one mile and a half. There is a large quantity of redgum saplings on the north-west portion of the forest, which, if thinned out, would produce valuable trees.

In my opinion, the west side of Fyans Creek (in the old forest) would be admirably adapted for a nursery for young trees. There is already a large quantity of saplings growing, both of redgum and stringybark.

The eastern portion of the forest, near the north boundary, has some good redgums on it; but as it nears the ranges the timber changes its character, and consists of scrubby peppermints and wattles, with a few redgums intermixed. This portion of the forest, after joining the ranges, is wooded with stringybark of an inferior description.

Going south through Hall's Gap, and entering the valley, for some short distance, the timber entirely changes its character, consisting of scrubby wattles honeysuckles, and other useless timber, extending for about two miles along Fyans Creek, by about a mile in breadth. The slopes of the ranges to the east and west of this useless portion of forest are wooded with stringybark of pretty good quality ; the timber being better on the west range than on the east.

I may mention that the portion of forest above described as being useless might be excised, as it is of little value as forest land.

There is a small selection of about thirty acres in this portion of the forest held by Edward Evans.

On still going south, until within a short distance of the southern boundary line of the old forest, the timber again changes in the centre of the valley, and consists of a description of whitegum, which is apparently good, useful timber; but I am informed that it is of little value either for sawing or splitting purposes. When sawn, it twists greatly, it is very hard to split, and not at all durable. I have inspected this timber, and examined it carefully, both when it has been newly fallen, and after it has been used for some time. When green, it is quite soft, and when fallen some time it cracks greatly, and soon rots.

There is not much of the last description of timber in the old forest, as it commences near the boundary of the newly proclaimed portion, upon which I will now proceed to report.

The timber last mentioned runs nearly south through the valley along Fyans Creek for seven or eight miles, and in breadth is about a mile. It is intermixed with a few wattles and some inferior blackwoods, and is bounded on each side by stringybark, which grows to the top of the ranges. The west range has very good timber on it, but on the eastern range the timber is short and twisted.

In my opinion, the whole of the land on which this description of timber grows is of little value as forest land, and might be excised without injury to the forest.

The creek, in many places, forms itself into swamps ; and it is probable that the excess of moisture causes the timber to be so sappy.

At the termination of the whitegum, near Barney's Creek, the timber changes to good stringybark, useful both for sawmill and splitting purposes. There is also some fine messmate in this portion of the forest, and in places wattle and inferior blackwoods.

The rest of the forest to the south is the only portion where there is a good supply of useful timber in large quantities.

A great number of the trees have been destroyed by bark-stripping—both messmates, stringybarks, and wattles; also I have to report that during the past summer there have been some very large fires in the Grampians, which have destroyed a good number of young trees.

Ledcourt.

I have the honor to report that I have visited the Ledcourt State forest on several occasions, and have inspected it carefully. I had great difficulty in defining the boundaries on the north-east side, as it is very irregular, and would suggest that the road shown on the plan of the parish of Ledcourt (which, I believe, is the Horsham road) would be a better boundary to the forest than the present one. The timber on the Crown lands between the present boundary of the forest and the above-mentioned road is of good, useful character.

With regard to the timber, I will first commence with the north-eastern side of the forest, on which the timber consists of several varieties, some portions being timbered by stunted stringybark; but the principal timber on the above-named side of the forest consists of whitegum, messmate, box, and a few redgums, with here and there a few sheoaks and stringybarks, and also a few cherry trees. The whitegums and box are of good, useful size for props and splitting purposes; the messmates and redgums are also of a good, useful description.

Going westward from the above-mentioned portion of the forest, for a considerable distance the timber continues the same as above described, only that in places the redgum is more plentiful. When nearing the western side of the forest, the timber consists principally of stringybark and messmate, of good, useful description for sawmill use and splitting purposes.

On the south-west side of the forest—in fact, nearly south—the timber is very inferior to what it is in the rest of the forest, consisting principally of scrubby stringybark.

A great number of props has been cut in this forest, and there is still a good supply of timber for same. In portions of the forest there is a number of saplings growing, which, in a few years, will become good timber.

Throughout the whole of the forest the soil is of a poor, sandy nature.

Kirkella.

The timber in the above-named forest consists of the following varieties—whitegum, box, honeysuckle, and bulloak; the two first-named being of a useful description for props and splitting purposes; the two last-mentioned being of no value.

The forest is not very thickly timbered; and in portions of it there are bare patches, and in other places clumps of honeysuckle. There are in places some good saplings both of box and whitegum, which, if thinned out, would make good, useful trees in a few years. If the honeysuckle and bulloaks were also cut down, it would facilitate the growth of the young trees greatly.

There has been a great number of props cut from this forest, and they are still being cut, as it is one of the nearest places to the mines where they can get the proper timber for the purpose.

There is still a good supply of timber on the reserve, and, in my opinion, it is one of the most useful forests for mining purposes in the Stawell district.

I have also to report that there are two blocks of Crown land on the east side of the forest growing as good timber. If these were included in the forest, it would be a useful addition to it.

Throughout the whole of the forest the soil is poor and sandy.

Moyston.

I can only partially report on the above-named State forest, as I have not been able to make myself sufficiently acquainted with it. I will therefore simply report on the timber which I saw in the forest.

The forest is rather thickly timbered, and consists principally of stringybark, which description of timber runs along to the foot of the Grampians, and is of good, useful quality. There is also some very good redgum in the forest, but in no large quantity.

The timber, taking it all through, is good, useful timber for splitting purposes.

Beechworth.

Mr. Forester Dudley reports that, although much destruction has been carried on for many years, there still remains a large part of the forest well stocked with bluegum, messmate, and peppermint of good size. The saplings are sufficiently numerous to fill up the gaps made in the forest, if let grow. It has been the custom, however, for men to cut these for firewood for the quartz claims, they being able to earn more a day splitting them than larger trees.

There are five sawmills at work, having contracts from the Beechworth Railway contractors, and mining claims at Eldorado, and elsewhere.

These mills employ about twenty-nine hands, all told. The steam-power of the engines driving them amounts to eighty-two horse-power. The average produce of each mill is about 7,000 feet super. per week.

The average number of men (not employed in the mills) working in the State forest as splitters is about twelve.

Mr. Forester Chapman reports as follows:—

Castlemaine.

I traversed the above reserve from the Devonshire reef thence to the northern boundary. I found it a mass of saplings and shoots from old stumps; I saw no standing timber. I very much question if the saplings, &c., that are left will be of any use, the soil of the reserve being of such a rocky nature with very inferior soil interspersed.

I am of opinion the reserve is of very little use to a district like Castlemaine.

If planted, I very much question if the young trees would grow to any size; there is not a redeeming point in it.

There is very little grazing ground.

Mount Alexander.

From the foot of the mount over to the Axe Creek I find the timber small and very thinly distributed—about fifteen trees to the acre. On the top of the mount I noticed a few saplings or seedlings; I found no seedlings elsewhere.

The timber consists of box, stringybark, blackwood, and a few gums of a very stunted growth; the timber generally of little use except for firewood.

The forest has not been much disturbed. There are some five or six men employed in the forest getting wattlebark and firewood. The land is of a sandy nature, interspersed with granite rocks. The whole of the forest is available for grazing, and would support, on an average, one beast to three and a half acres. With reference to planting this forest, I think it might be done to advantage, especially in the gullies, but not with the same class of timber.

Sandon and Campbelltown.

I have the honor to report that there is no timber of any value excepting for firewood. What remains is of stunted growth. The splitters have pronounced it worked out; any that are at work are on private property. The trees formerly growing were a sort of bastard bluegum; a few are still left in private property; the timber is of no great value.

Saplings are growing more or less throughout the forest, but of no great size or quality—chiefly box and stringybark. I am informed that great injury has been done to the forest by parties cutting young trees for props, &c.; even as small as four inches in diameter do not escape them. I saw one party only in the forest at work.

The land is of inferior quality, of a gravelly nature, with a dry, rocky aspect, and in no part have I seen it fit for cultivation.

The grazing qualities are about three and a half acres to the beast; I do not think the land would carry any more.

The forest has not a very promising appearance; but I have no doubt, if protected, it would become useful at a future period.

Strangways.

I have the honor to report as follows:—The timber available for splitting and other useful purposes is almost cleared out; what remains is merely fit for firewood; it is box and stringybark. There are a few trees of good growth, but the majority are small and stunted.

Saplings are growing more or less throughout the reserve, but not of first-class quality, on account of the poorness of the soil, which is gravelly, and in parts rocky. There is very little of it that would be worth anything for cultivation.

With reference to the grazing qualities, I may safely say that it would require three acres to the beast; if it was fenced in, there are parties that would lease it for a term of years for the grass only.

A complaint was made to me by a Mr. Francis Dibb that persons were cutting saplings within the boundaries of the reserve. In going through I found it was so, and that stacks of saplings had been cut ready for removal. I could find no one to claim them.

There are also a number of miners at work, and residing in the forest, having small plots of ground enclosed for gardening purposes.

It would be very hard to give a correct account of the quantity of timber to the acre; approximately, I should say that there are about fifteen trees—good, bad, and indifferent—per acre.

APPENDIX IX.

Schedule of Timber Reserves of the First Class.

Name of Reserve.	Area.	Date of *Gazette* Notice of Proclamation.	Name of Reserve.	Area.	Date of *Gazette* Notice of Proclamation.
	Acres.			Acres.	
Barmah ...	19,600	16.7.69	Mount Cole... ...	32,740	25.10.72 21.10.73
Cape Otway ...	193,000	16.5.73	Mount Macedon ...	14,685	3.3.68 10.7.73
Dandenong and Woori Yallock	26,500	15.3.72	Moira and Yielima...	45,000	3.6.70
Grampians ...	134,576	15.5.74	Wombat or Bullarook	110,000	29.9.68 2.1.74
Gunbower ...	70,000	16.1.74	Victoria	136,000	21.3.73

Schedules of other Timber Reserves.—(A.) Those proclaimed as State Forests or that are such by Regulation.

Name of Reserve.	Section and Land Act.	Area.			Date of *Gazette* Notice of Proclamation.
		A.	R.	P.	
Beechworth S. F.	5/62	16,000	0	0	24.11.68
Bet Bet and Maryborough	53/69	5,500	0	0	16.9.70
Ballarat S. F.	53/69	1,200	0	0	6.12.72
Ballarat and Creswick S. F.	53/69	13,822	0	0	5.4.72
Briagolong S. F.	53/69	1,600	2	22	20.9.72
Cardigan and Haddon S. F.	6/69	1,050	0	0	15.11.72
Clunes and Eglinton S. F.	53/69	2,900	0	0	15.9.71
Craigie S. F.	53/69	3,620	0	0	15.9.71
Echuca North	41/65	2,310	0	0	12.1.69
Eglinton S. F.	53/69	2,350	0	0	15.9.71
Egerton and Kamarooka S. F. ...	53/69	24,000	0	0	3.10.73
Ellesmere and Axedale S. F.	6 & 53/69	18,000	0	0	8.5.74
Flinders	53/69	556	0	24	15.7.73
Gooramadda	53/69	1,000	0	0	30.9.70
Havelock S. F.	53/69	4,600	0	0	15.9.71
Kirkella	53/69	1,614	3	21	21.10.70
Ledcourt	53/69	18,559	0	0	22.1.75
Mount Alexander S. F.	6/69	3,740	0	0	21.4.68 2.1.74
Mount Disappointment	53/69	30,000	0	0	31.3.71
Moyston S. F.	53/69	2,750	0	0	31.5.72
Phillip Island	53/69	600	2	37	15.7.70
Rodney, County (near Murchison) ...	41/65	31,640	0	0	27.11.68 20.3.74
Sandon and Campbelltown S. F. ...	53/69	6,846	0	0	15.9.71 23.8.72
Strangways S. F....	6 & 53/69	773	0	0	29.9.71 7.6.72
St. Arnaud	53/69	370	0	0	6.2.74
Tower Hill Island S. F.	53/69	400	0	0	17.5.72
Warrenheip, Mount	41/65 53/69	190	1	29	27.8.67 20.6.73
Wareek S. F.	53/69	3,000	0	0	15.9.71
Yandoit	53/69	1,050	0	0	9.9.70
Yangardook S. F....	53/69	1,200	0	0	18.10.72

(B.) All other Timber Reserves.

Name of Reserve.	Section and Land Act.	Area. A.	R.	P.	Date of *Gazette* Notice of Proclamation.
Ararat	5/62	6,000	0	0	24.7.66
Ararat	6/69	3,560	0	0	31.5.72
Ararat	6/69	1,800	0	0	6.12.72
Ararat and Dunneworthy	6/69	4,100	0	0	31.5.72
Buninyong, Shire of	6/69	12,000	0	0	28.10.70 14.11.73
Ballyrogan	5/69	314	2	22	13.8.67
Ballyrogan	5/69	157	2	38	22.11.72
Burke	5/62	537	2	3	8.1.69
Bruk Bruk	6/69	384	0	4	14.10.70
Baringhup	6/69	79	3	23	21.5.71 6.6.73
Bungal	6/69	1,400	0	0	12.5.71
Bungal (extension)	6/69	530	0	0	15.8.73
Craigie	6/69	2,900	0	0	25.2.70
Connewarren	2/60	6,424	0	0	21.2.62
Castlemaine (Walmer)	5/62	2,000	0	0	24.11.68
Carngham	6/69	2,900	0	0	4.8.71
Caralulup	6/69	394	2	37	12.7.72
Carrah (Inverleigh)	6/69	2,765	0	0	29.11.72
Campaspe	6/69	640	0	0	15.8.73
Cobaw	6/69	690	0	0	25.9.74
Corop	6/69	135	1	27	10.9.73
Carrah (Shelford)	6/69	615	1	6	5.12.73
Dean and Moorabool	5/62	39,000	0	0	15.8.65
Dunkeld	6/69	500	0	0	23.5.73
Dookie	6/69	128	2	5	3.10.73
Eddington	5/62	312	2	30	5.5.68 21.6.72
Emberton	5/62	260	0	0	15.12.68
Elphinstone	5/62	3,600	0	0	7.5.69
Elphinstone (extension)	6/69	213	0	0	7.10.70
Fryers	5/62	1,800	0	0	9.7.69
Gooramadda	6/69	1,400	0	0	23.1.74
Glenormiston	2/60	881	1	19	21.2.62
Gherang Gherang	5/62	212	2	0	19.2.69
Glenalbyn	6/69	5,580	0	0	25.9.74
Glenlyon	5/62	5,026	0	0	11.7.65 20.10.71
Hampden	2/60	3,525	0	0	21.2.62
Jung Jung	6/69	245	2	22	25.9.74
Karabeal	6/69	241	1	24	26.7.72
Lexington and Kalymna	5/62	3,344	2	22	29.9.68
Lal Lat	6/69	2,185	0	0	11.9.74
Layard	5/62	240	0	0	19.2.69
Langi Logan	5/62	234	1	20	21.1.70
Langley	6/69	150	0	0	1.5.71
Langi Ghiran	6/69	5,350	0	0	31.5.72
Marmah and Warranooke	6/69	2,439	0	0	31.12.74
Metcalfe	5/62	598	0	0	15.12.68
Mokanger	6/69	1,662	1	18	29.8.73
Marnoo	6/69	450	0	0	5.1.75
Meredith	6/69	1,100	0	0	22.9.71

(B.) All other Timber Reserves—*continued.*

Name, &c.	Section and Land Act.	Area. A. R. P.	Date of *Gazette* Notice of Proclamation.
Nanapundah	5/62	562 0 16	7.5.69 19.5.71
Neereman	6/69	160 0 0	21.4.71
Natte Yallock and Rathscar	6/69	6,900 0 0	18.7.73
Burrumbeet	2/60	5,500 0 0	21.2.62
Redesdale	5/62 6/69	1,210 0 0	15.12.68 12.5.71
Rochford	6/69	159 3 23	5.4.72
Scarsdale, Argyle, &c.	6/69	4,750 0 0	29.8.73
Sandford	6/69	23 1 8	25.4.73
Tandarook, Marida Yallock, &c. ...	2/60	5,400 0 0	21.2.62
Trawalla	6/69	1,420 0 0	12.2.75
Villiers, County	2/60	6,340 0 0	21.2.62
Woorndoo	5/62	497 1 33	1.10.67
Warrambine	5/62	710 0 0	29.1.69
Wanalta	6/69	5,000 0 0	27.11.74
Yangery	2/60	2,680 0 0	21.2.62

Other Proclamations.

Ararat and Horsham Road, two chains on each side of	52/69	...	11.9.74
Amherst and other parishes, County Talbot	52/69	...	8.9.71
Buninyong Borough	52/69	...	20.9.72
Ballarat Town Common	52/69	...	22.7.70
Beckworth	62/62	1,060 0 0	27.7.66
Bellarine, Shire of	62/62	...	31.1.68
Cheltenham	52/69	...	21.6.72
Colac Town Common	52/69	...	13.6.73
Clunes (extension of Beckworth) ...	62/62	225 0 0	12.3.67
Corop and Burrumbeet (around Lake Cooper)	62/62	...	11.9.66
Echuca Borough (west of Campaspe) ...	52/69	...	21.6.72
Fingal	62/62	...	31.5.67
Gippsland East (cabbage palms, protected)	52/69	...	7.7.71
Grenville Shire	...	...	30.8.72
Horsham (village and Nine-mile reserve)	52/69	...	18.2.70
Kilmore (drainage area of reservoir) ...	52/69	...	30.8.72
Lake Burrumbeet (3 chains along margin)	52/69	...	16.6.71
Murray Pine Reserve	52/69	...	8.11.72
Mount Disappointment	52/69	...	2.5.73
Maldon, Mount Tarrengower	62/62	...	13.4.65
Maldon and Baringhup, extent of ditto	62/62	1,664 0 0	21.4.68
Mordialloc	62/62	316 0 0	20.11.68
Nanapundah	62/62	2,375 0 0	16.6.68
Phillip Island (1 mile from high-water mark)	62/62	...	15.1.69
Phillip Island	62/62	...	12.1.69
Sandhurst and Eaglehawk	52/69	...	24.1.73
Stawell (12 miles radius from Town Hall)	52/69	...	15.3.72

OTHER PROCLAMATIONS—*continued.*

Name, &c.	Section and Land Act.	Area.	Date of *Gazette* Notice of Proclamation.
		A. R. P.	
Sandhurst, Inglewood, and Loddon District Tramway Company ...	62/62	24,000 0 0	17.10.65
Sale Borough Common (portion) ...	62/62	...	18.12.66
Terrick Hills Timber Reserve	52/69	11,816 0 0	20.9.72
Warrandyte	52/69	1,142 2 0	11.10.73 21.10.73
Warringall Town Reserve	62/62	...	28.4.65
Wurdi Youang	62/62	2,600 0 0	30.1.66
Wurdi Youang	62/62	2,400 0 0	29 5.66
Yan Yean (drainage area of reservoir)	52/69	...	15.3.72
Yan Yean (portion of watershed area)	52/69	...	11.10.72
All permanent reserves around lakes, lagoons, rivers, creeks, bays, or fronting Southern Ocean and Bass' Straits	52/69	...	17.7.74

APPENDIX X.

RETURN SHOWING THE KINDS, QUANTITIES, AND VALUES OF TIMBER IMPORTED INTO VICTORIA DURING THE TEN YEARS ENDING 1873.

Kind.	1864.				1865.			
	Quantity.	Value.			Quantity.	Value.		
		£	*s.*	*d.*		£	*s.*	*d.*
Deals	200,381 No.	53,647	0	0	194,475 No.	73,975	0	0
Laths	30,884 bdls.	3,897	0	0	24,955 bdls.	3,431	0	0
Logs and Piles	2,988 No.	18,665	0	0	1,275 No.	5,685	0	0
Palings ...	4,001,978 „	26,868	0	0	3,483,479 „	24,395	0	0
Posts and Rails	1,826 „	56	0	0	100 „	8	0	0
Sawn	19,282,316 feet	182,094	0	0	13,364,850 feet	145,138	0	0
Shingles ...	584,215 No.	627	0	0	755,100 No.	604	0	0
Spars	102 „	160	0	0	32 „	189	0	0
Miscellaneous	...	32,108	0	0	...	18,423	0	0
Total ...	...	318,122	0	0	...	271,848	0	0

Kind.	1866.				1867.			
	Quantity.	Value.			Quantity.	Value.		
		£	*s.*	*d.*		£	*s.*	*d.*
Deals	226,801 No.	71,122	0	0	272,083 No.	61,567	0	0
Laths ...	26,780 bdls.	4,155	0	0	20,863 bdls.	1,715	0	0
Logs and Piles	5,274 No.	12,734	0	0	4,556 No.	23,956	0	0
Palings ...	2,757,545 „	19,610	0	0	2,935,648 „	12,132	0	0
Posts and Rails	...	...			4,500 „	60	0	0
Sawn	13,318,747 feet	152,491	0	0	11,952,940 feet	81,642	0	0
Shingles ...	695,224 No.	542	0	0	431,800 No.	267	0	0
Spars ...	154 „	1,060	0	0	84 „	90	0	0
Miscellaneous	...	79,489	0	0	...	36,315	0	0
Total ...	...	341,203	0	0	...	217,744	0	0

RETURN SHOWING THE KINDS, QUANTITIES, AND VALUES OF TIMBER IMPORTED INTO VICTORIA DURING THE TEN YEARS ENDING 1873—*continued.*

Kind.	1868.				1869.			
	Quantity.	Value.			Quantity.	Value.		
		£	*s.*	*d.*		£	*s.*	*d.*
Deals	368,977 No.	50,359	0	0	354,449 No.	50,544	0	0
Laths ...	28,424 bdls.	1,987	0	0	69,960 bdls.	3,178	0	0
Logs and Piles	7,088 No.	26,800	0	0	9,008 No.	31,781	0	0
Palings ...	3,661,321 „	15,223	5	0	2,776,180 „	10,688	0	0
Posts and Rails	5,312 „	70	0	0	7,027 „	82	0	0
Sawn	13,117,413 feet	83,609	0	0	27,113,367 feet	162,195	0	0
Shingles ...	338,200 No.	159	0	0	280,350 No.	149	10	0
Spars	115 „	83	0	0	300 „	84	0	0
Miscellaneous	...	29,465	0	0	...	27,214	0	0
Total ...	...	207,755	5	0	...	285,915	10	0

Kind.	1870.				1871.			
	Quantity.	Value.			Quantity.	Value.		
		£	*s.*	*d.*		£	*s.*	*d.*
Deals	475,766 No.	55,663	0	0	90,894 No. 6,465,500 feet	38,600	0	0
Laths ...	38,701 bdls. 91,032 No.	2,893	0	0	7,919 bdls. 1,517,000 No.	1,453	0	0
Logs and Piles	6,257 No.	23,849	0	0	6,701 „	26,183	0	0
Palings ...	2,309,129 „	7,821	10	0	3,497,448 „	12,252	0	0
Posts and Rails	5,200 „	55	0	0	2,425 „	28	0	0
Sawn	24,701,701 feet	126,138	0	0	6,690,254 feet	29,442	0	0
Shingles ...	169,736 No.	75	0	0	37,250 No.	18	0	0
Spars	208 „	49	0	0	22 „ 2,400 feet	12	0	0
Miscellaneous	...	7,224	0	0	...	64,814	0	0
Total ...	...	223,767	10	0	...	172,802	0	0

Kind.	1872.				1873.			
	Quantity.	Value.			Quantity.	Value.		
		£	*s.*	*d.*		£	*s.*	*d.*
Deals	9,718,600 sup.ft.	71,061	0	0	17,198,092 sup.ft.	197,049	0	0
Laths	2,576,300 No.	2,618	3	0	4,129,000 No.	6,607	0	0
Logs and Piles	8,127 „	35,040	0	0	17,248 „	77,169	0	0
Palings ...	3,580,533 „	14,932	0	0	3,681,200 „	18,502	10	0
Posts and Rails	7,005 „	109	10	0	3,000 „	36	0	0
Sawn	771,457 feet	2,619	10	1	237,019 feet	967	0	0
Shingles ...	195,000 No.	96	0	0	337,500 No.	237	0	0
Spars	13,300 feet	79	0	0	12,710 feet	166	0	0
Miscellaneous	...	175,275	17	10	...	287,764	12	0
Total ...	...	301,831	0	11	...	588,498	2	0

IMPORTS OF TIMBER, 1874.

Kind.	Quantity.	Value.		
		£	s.	d.
Dressed	12,712,119 sup. feet	149,111	0	0
Undressed	9,976,310 „	86,138	6	0
Deals	10,156,200 „	113,093	0	0
Laths	5,398,500 No.	7,671	0	0
Logs	17,866 „	92,246	0	0
Palings	3,021,572 „	16,638	10	0
Pickets	499,800 „	3,646	0	0
Posts and Rails	9,200 „	192	0	0
Shingles	225,200 „	117	0	0
Shooks and Staves	91,288 „	3,416	0	0
Do. Dressed ...	1,504 packages	116	16	10
Spars	5,400 feet	100	0	0
Spokes and Felloes	123,150 No.	1,557	0	0
Do. Dressed ...	15 packages	103	2	10
Miscellaneous—Value only ...	...	4,197	10	0
Total	...	478,403	5	8

APPENDIX XI.

RETURN SHOWING THE ANNUAL EXPORT OF EACH KIND OF TIMBER THE PRODUCE OF THIS COLONY DURING THE TEN YEARS 1864–1873, THE PROPORTIONS TO EACH COUNTRY, AND THE VALUE OF SUCH EXPORTS.

Country to which Exported.	Logs and Piles.		Sawn.		Palings and Shingles.		Miscellaneous.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Value.
1864.	No.	£	Feet.	£	No.	£	£
United Kingdom ...	8	50	...	...	...	...	5
New South Wales	3	12	167,500	1,449	193,000	472	144
New Zealand ...	46	230	36,207	310	...	...	76
South Australia ...	...	...	31,520	153	...	...	...
Tasmania	...	...	500	4	...	...	...
Total ...	59	292	235,727	1,916	193,000	472	225
1865.							
United Kingdom ...	...	...	...	...	...	...	526
New South Wales	...	...	...	...	84,320	361	257
New Zealand ...	1	3	46,700	573	...	...	...
South Australia ...	65	400	3,000	27	...	...	12
Tasmania	...	...	...	...	...	...	54
Bombay	869	1,700	128,000	640	...	...	300
Total ...	935	2,103	177,700	1,240	84,320	361	366

RETURN SHOWING THE ANNUAL EXPORT OF TIMBER, ETC.—*continued.*

Country to which Exported.	Logs and Piles.		Sawn.		Palings and Shingles.		Miscellaneous.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Value.
1866.	No.	£	Feet	£	No.	£	£
United Kingdom ...	2,535	837	...	...	...	...	1,225
New South Wales	...	...	45,247	318	71,600	85	6
New Zealand ...	...	...	13,728	194	4,000	50	89
South Australia ...	...	...	133,796	638	2,000	20	498
Tasmania	...	...	2,000	25	700	5	16
Total ...	2,535	837	194,771	1,175	78,300	160	1,834
1867.							
United Kingdom ...	...	...	...	...	...	...	100
New South Wales	...	...	129,810	1,089	103,320	144	5
South Australia ...	...	...	262,822	1,180	...	...	303
Tasmania	...	...	3,769	35	...	...	14
Total ...	...	...	396,401	2,304	103,320	144	422
1868.							
No account ...	14	87	165,977	1,425	134,000	240	478
1869.							
United Kingdom ...	...	...	...	...	...	...	200
New South Wales	...	...	3,469	34	...	...	...
New Zealand ...	...	...	...	...	...	...	18
South Australia ...	...	...	6,425	55	...	...	...
Tasmania	...	...	2,900	29	...	...	10
Calcutta	...	...	604,772	7,200	...	...	...
Ceylon	...	...	200	5	...	...	1
Total ...	...	...	617,766	7,323	...	...	229
1870.							
United Kingdom ...	460	221	...	...	...	...	...
New South Wales	...	...	20,412	112	...	...	...
New Zealand ...	...	...	...	...	...	...	1
South Australia ...	...	...	1,100	8	...	...	27
Tasmania	...	...	...	...	...	...	10
Western Australia	...	...	...	...	...	...	4
Fiji...	...	...	21,000	108	...	...	336
Malden Island ...	...	...	12,000	110	...	...	132
Total ...	460	221	54,512	338	...	...	510
1871.							
United Kingdom ...	...	...	...	...	...	...	10
New South Wales	...	...	3,112	35	27,700	40	...
New Zealand ...	...	...	1,275	10	...	...	31
South Australia ...	...	...	...	...	4,000	36	15
Tasmania	...	...	9,160	75	...	...	38
Calcutta	...	...	...	...	...	...	2,980
Ceylon	...	...	...	...	...	...	40
Madras	...	...	...	...	...	...	75
Total ...	...	...	13,547	120	31,700	76	3,189

RETURN SHOWING THE ANNUAL EXPORT OF TIMBER, ETC.—*continued.*

Country to which Exported.	Logs and Piles.		Sawn.		Palings and Shingles.		Miscellaneous.
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Value.
1872.	No.	£	Feet.	£	No.	£	£
United Kingdom...	...	...	...	...	...	...	53
New South Wales	...	...	113,817	863	28,800	48	135
New Zealand ...	...	...	...	...	...	...	271
South Australia ...	...	...	...	...	10,000	74	346
Boston, U.S.A. ...	...	...	...	...	...	...	40
Ceylon	...	...	...	...	...	...	3
Madras	...	...	...	...	...	...	1
Total ...	...	...	113,817	863	38,800	122	849
1873.							
United Kingdom...	7	42	...	...	...	...	105
New South Wales	...	...	145,368	901	33,400	69	73
New Zealand ...	...	...	...	...	...	...	210
South Australia ...	...	...	8,177	46	5,550	11	587
Tasmania	...	...	...	...	...	...	31
Madras	...	...	...	...	...	...	5
Total ...	7	42	153,545	947	38,950	80	1,011
Total for Ten years	4,010	3,582	2,096,763	17,651	702,390	1,655	9,113

EXPORTS OF TIMBER, 1874.

Kind.	Quantity.	Value.
		£
Dressed	567,712 ft. super.	6,467
Undressed	464,085 „	6,303
Deals	110 No.	45
Laths	88,080 „	144
Logs	263 „	2,720
Palings	30,500 „	274
Posts and Rails	52 „	1
Sawn	443,646 ft. super.	3,196
Shingles	93,550 No.	105
Shooks and Staves	2,345 packages.	88
Spokes and Felloes	5,063 „	185
Miscellaneous	... ...	9,750
Total	... ...	29,278
EXPORTS FOR DRAWBACK.		
Dressed	379,203 feet	4,149
Undressed	196,418 „	2,759
Grand Total Exports, 1874	... ...	36,186

APPENDIX XII.

RETURN SHOWING THE QUANTITY AND VALUE OF BARK EXPORTED DURING THE TEN YEARS ENDING 1873 AND FOR 1874.

Year.	Quantity.	Value.		
		£	s.	d.
1863	469 tons 18 cwt.	6,085	0	0
1864	156 „ 14 „	1,397	0	0
1865	1,116 „ 0 „	8,037	0	0
1866	1,583 „ 4 „	12,144	0	0
1867	838 „ 16 „	7,021	0	0
1868	537 „ 15 „	2,965	0	0
1869	720 „ 11 „	3,734	0	0
1870	1,386 „ 19 „	6,484	0	0
1871	1,547 „ 18 „	6,155	0	0
1872	4,504 „ $15\frac{8}{112}$ „	20,558	15	0
1873	3,141 „ 3 „	12,813	0	0
1874	1,403 „ 2 „	7,741	0	0

REPORT OF SUPERINTENDENT OF STATE NURSERY.

SIR,

I have the honor to submit my Annual Report on the progress of the labor in the State Nursery and Forest Reserve at Mount Macedon during the past year.

The total area within the nursery enclosure comprises forty-one acres, including nine acres of water, which can be made available for watering young trees in dry seasons if necessary.

The early part of the season was very dry and trying to newly-planted trees in many localities; but this nursery being situated in a district where the annual rainfall is considerably above the average, I have the honor to report a very satisfactory growth and no loss of plants in dry weather.

The area at present under cultivation and stocked with young trees is about eight acres, which has been thoroughly drained, subsoiled, and trenched by hand where necessary.

Several hundred loads of rich alluvial soil have been carted from deposits in gullies in the vicinity, and, according as the ground was required for cropping, large quantities of rich vegetable soil have been added, particularly where the soil was shallow and of inferior quality. This work necessitated a considerable amount of labor; nevertheless, it was absolutely necessary, in order to get the land into proper condition, to ensure plenty of root-fibre to young trees, a condition most essential to the success of rearing young trees to be transplanted and carried to forests at a distance from the nursery. Those portions of the nursery thus operated upon are in the very best condition, and no doubt will soon repay the extra labor expended upon them.

Roads for the convenience of carting soils, manure, &c., have been made, intersecting the grounds at suitable distances. On either side of these roads lines of Platanus orientalis have been planted to afford shelter and shade, as well as to improve the general appearance of the nursery; these trees have succeeded fully to my expectations, and will soon become splendid avenues. Seeing how suitable this plane is for this district, I propose to continue it throughout as the principal avenue tree for shelter or ornament. Many of these trees have grown fully six feet during the season.

A road leading to the Superintendent's quarters has been formed during the past year; on each side of this drive a row of coniferous trees has been planted, chiefly with the view of showing the habit of those trees in their several stages of growth, and of procuring seeds of such as prove most desirable for forest culture hereafter.

These comprise specimens of Abies Douglasii, A. Albertiana, A. Cephalonica, A. Menziesii, A. Fraserii, A. excelsa; Araucaria imbricata, Ar. Bidwillii; Cedrus deodara, C. Libani, C. Atlantica; Cupressus Lambertiana, C. Goveniana, C. Lawsoniana, C. torulosa, C. glauca; Picea Webbiana, P. Nordmanniana; Thuga Lobbii, Thujopsis borealis, Taxodium sempervirens, Wellingtonia gigantea, Pinus ponderosa, P. insignis, P. tuberculata, P. excelsa, and P. Sabiniana. These trees were planted in July last, and some of them have grown fully three feet in height during the past season. Groups of quick-growing, useful kinds of timber trees are planted in exposed situations, to intercept the blast of prevailing winds from different quarters. Numbers of the best kinds of timber trees, including walnut, hickory, chestnut, oak, elm, ash, lime, platanus, birch, and other deciduous trees, have been planted in suitable places within this reserve, so that in future years they will afford the means of obtaining supplies of seed for forest culture.

The ground under cultivation has been divided into quarters, and separated by hedges of various kinds of evergreen shrubs and trees, suitable for providing shelter. The principal hedges planted are Pittosporum nigrescens, P. eugenoides, P. Ralphii; Olea Europea, white thorn, privet, Cupressus macrocarpa, C. Goveniana, C. torulosa, and C. Benthamiana. Several of these hedges have already grown fully five feet in height, and will soon afford the shelter for which they are intended.

Three acres additional were cleared, drained, subsoiled, and divided into quarters during the past summer, upon which upwards of 100 loads per acre of rich alluvial soil have been spread, and by subsequent labor dug into and thoroughly pulverised and incorporated throughout. This labor was performed at a cost of about £15 per acre, including ploughing, cartage of soil, draining, and other labor. I would remark that the drains are dug from four to five feet deep, and carefully laid with stone quarried on the adjacent reserve for this purpose. This land is quite ready for planting, and is now in splendid condition.

In addition to the above, nearly four acres at the eastern division of the nursery have recently been cleared, grubbed, and made ready for

the plough. This portion, although not necessarily required for immediate cultivation, is so full of sorrel and other weeds that it will require breaking up with the plough and frequent stirrings during summer, to get it clean and fit for the reception of young trees the following autumn.

The cost of preparing this portion of the ground is £40, or at the rate of about £10 per acre.

In July last 1,000 trees, of Pinus insignis and Cupressus Lambertiana, were transplanted from the nursery rows to the southern slope of the range, immediately adjoining the reservoir, and within the nursery enclosure. This slope is very steep, and not suited for cultivation. The trees are planted at distances varying from fifteen to twenty feet apart, pits being dug, as in the ordinary manner of forest planting, and costing very little labor in preparation; this experiment was tried with the view of testing what can be done with similar situations and soil. Those trees have never been watered artificially since they were planted, and I have now to report the most satisfactory progress in the growth of this plantation; only one or two plants have failed out of the whole number (1,000), and many have made a growth of two and three feet in height, and promise soon to become ornamental and useful timber trees.

The total cost of labor in connection with this nursery, from the commencement of this financial year to the 1st May 1875, or for the ten months, is as under :—

	£	s.	d.
July	36	0	0
August	36	8	0
September...	35	16	0
October	37	16	0
November	31	1	0
December	33	15	0
January	40	10	0
February	39	12	0
March	44	11	0
April	48	7	6
	383	16	6
Aproximate : Stores and tools ...	40	0	0
„ Horse feed	40	0	0
„ Seeds...	25	0	0
	£488	16	6

The young trees in the nursery are in a very healthy growing condition, and comprise the following species:—

Transplanted into nursery lines.

Abies alba	400	Pinus insignis	21,000
balsamea	400	maritima	600
Douglasii	300	monticola	150
Fraserii	550	ponderosa	400
Smithiana	500	radiata	1,000
Webbiana	2,750	rigida	1,000
Betula alba	100	Strobus	300
Cedrus deodara	400	Populus alba	100
Cupressus glauca	300	Canadensis	100
Lambertiana	2,500	Platanus orientalis	300
torulosa	300	pseudo-platanus	1,000
Eucalyptus globulus	1,250	Quercus pedunculata	5,950
various sp.	1,000	Sp.	500
Fraxinus excelsior	1,200	Retinospora obtusa	200
Juglans nigra	100	Thuga gigantea	200
regia	250	Taxodium distichum	150
Morus sp.	800	Wellingtonia gigantea	1,200
Pinus Benthamii	300		
contorta	350	Total transplanted	48,200
halepensis	300		

Trees in seed beds not transplanted.

Cupressus torulosa	1,000	Pinus Sabiniana	100
Eucalyptus, various	12,000	Quercus robur	10,000
Pinus contortia	300	Skinnerii	250
excelsa	1,000	Robinia Chinensis	1,000
insignis	8,000	Thorns for hedges	20,000
maritima	9,000		
radiata	100		62,750

The young trees that were transplanted into nursery lines last spring have grown as well as could be desired, particularly Pinus insignis, Cedrus deodara, Wellingtonia gigantea, and the several species of oak, ash, and plane. The number available for permanent planting this season will be about 40,000 plants.

State Forest Reserve, Mount Macedon.

The cost of labor in clearing, planting, and preparation for further extension of this plantation amounts to £367 16s. 6d. in whole:—

	£	s.	d.
1874—April	22	7	0
May	57	5	0
June	40	19	6
July	44	14	0
August	46	9	0
September	48	2	0
October	25	1	0
November	19	8	0
December	17	19	0
1875—January	15	12	0
February	13	16	0
March	16	4	0
	£367	16	6

This enclosure is situated at an altitude of 3,000 feet above sea-level, and contains 48 acres 31 perches, enclosed with a substantial three-rail fence. Previous to commencing operations, this area was densely covered with hazel scrub and rank growing fern. Immense quantities of heavy timber, the waste and destruction of former years, laid in every direction, necessitating a large amount of labor to clear and get into a condition fit for forest planting, or even sowing seeds of indigenous trees. About fifteen acres of this enclosure have been cleared by day labor, and planted with several species of non-indigenous trees; upwards of 4,000 forest trees have been planted on the area cleared, or an average of 300 trees per acre.

The season generally was favorable, and the trees grew with amazing rapidity, more especially the Cedrus deodara, Pinus insignis, Abies Douglasii, the British oak and ash; also bluegums, which had grown the height of two feet in a few months.

I have, however, to report, subsequent to planting, and just as the trees had become established, considerable injury was done to the young trees by wallaby and wild rabbits. These animals still continue to eat and destroy the young trees planted in the reserve, and I fear that until the fences have been made proof against the inroads of wallaby, which abound in the locality, or some means adopted to drive them from their haunts, very little satisfaction will result from planting trees on Mount

Macedon. Abundant proof of the destructiveness of these animals has been experienced by private gentlemen on the mountain, where they have completely destroyed large numbers of choice fruit and ornamental trees, compelling the owners of selections and other residents to fence in with paling fences, to preserve their trees from being completely destroyed.

I had the honor, some time since, to recommend the enclosing of this reserve with stout paling, as I feel certain nothing short of some precaution of this kind will prevent the ravages of those animals amongst young plantations.

Before any further planting is carried out in this enclosure several wires will be put between the panels of the fence to prevent the intrusion of wallaby, after which I hope to report a greater amount of success.

I have further to report a slight destruction of newly-planted exotic trees, by bush-fires, in January last. A small portion of the ground that had been recently planted was burned ; but this destruction was confined chiefly to about one acre, and the loss was only about 300 trees within the enclosure. Five hundred pines, principally insignis, were planted in open spaces of the forest, on the summit and along the crest of the mountain, in various places outside of the enclosed ground. The greater portion of these have been destroyed by bush-fires, and what few did escape from destruction in this way have subsequently been destroyed by cattle and other animals grazing in the forest. I consider it useless labor to attempt to plant trees, or even preserve the young indigenous trees with satisfaction, until a system has been adopted whereby certain portions of the forest can be enclosed for a time, to prevent cattle from destroying the young trees. I feel sure that, if blocks of forest land were enclosed and sown with seeds of indigenous trees, and precautions taken to prevent bush-fires, the results would be much more satisfactory and more economical.

I have the honor to be, Sir,
Your most obedt. servant,
WILLIAM FERGUSON,
Inspector of State Forests.

A. R. Wallis, Esq.,
Secretary for Agriculture.

REPORT ON THE GROWTH OF EXOTIC TIMBER TREES IN VARIOUS DISTRICTS OF VICTORIA.

Sir,

In 1868 I had the honor, by request, to furnish to the "Forest Board appointed by His Excellency the Governor in Council to inquire into and report on the best means of securing the permanency of the State Forests of Victoria" a report on the growth of several species of non-indigenous trees planted in the vicinity of Melbourne, with the view of comparing their growth within a certain number of years with those of the same species planted in Europe, and more especially in Great Britain.

The result of information collected at that time was of such a favorable nature that the Board recommended a number of species of exotic timber trees which they considered were most desirable for introduction on a large scale into the State forests of Victoria.

Very few persons at that time had turned their attention to planting non-indigenous forest trees on their own land, the information obtainable was therefore limited to a few years only, and to only a few localities.

Since that time, however, private gentlemen, district councils, municipal authorities, and mayors of cities, have recognized the importance of planting trees; and the planting of private properties, of parks and reserves under local control, and more recently of the streets of our principal towns, has been taken in hand in earnest.

The example set before the people by the Government in planting the various reserves around the city of Melbourne, under the direction of Mr. Clement Hodgkinson, the late Assistant-Commissioner of Lands, has not been without results in attracting public attention to the vast importance of an object so desirable.

There are others also who in their time have done their share in this good work, and although some of these have passed away from amongst us, they have left behind them a noble example of their perseverance which will need no historian to record—their labors remain for generations to come, as a memento of what can be accomplished under proper direction and energy. After an interval of about seven years, I have

the honor, in accordance with your instructions, to submit the following report on the progress made by many of those trees mentioned in my report of 1868, with additional notes taken in several parts of the colony, and at different times, as opportunity offered, where I have observed exotic trees planted for ornament or profit. To begin with those at Flemington, and now growing on the estate of the late Mr. Hugh Glass, I am glad to be able to report most favorably.

Large numbers of Araucaria Bidwillii (Bunya Bunya), planted in 1862, have attained to a height of thirty feet, some more, with a diameter of trunk twenty inches, and of branches thirty to fifty feet. Its noble associate, A. Cunninghamii, planted at the same time, has grown to similar dimensions. A. Braziliana and A. Bidwillii are closely allied species, the former from the Brazils, and the latter from Moreton Bay; the Brazilian species has not attained the height nor symmetry of Bidwillii, but, at the present time, its outline is grand, and being covered with enormous cones, is rendered still more interesting and beautiful. Araucaria Cookii, from New Caledonia, has also reached the height of thirty feet; one specimen in particular, which adorns the entrance to a private residence close by, and the progress of which I have watched for years past, has outstripped others in a more sheltered situation. I consider this species to be one of the handsomest of the whole group when fully developed. A. excelsa, the Norfolk Island pine, planted twenty years, has attained an altitude of sixty feet, or three feet annually. Numerous fine specimens of this species of younger date may be seen towering aloft, promising before another century has closed to reach the maximum altitude attained by this species in the once convict isle of the South Pacific. I would here remark that this species, as a rule, seldom succeeds at any distance from the sea-coast. I have occasionally met with fine healthy specimens at Hamilton, at Stawell, and other places far inland in the western districts of Victoria, and quite beyond the influence of the sea breeze so generally considered essential to their success.

Abies Douglasii, imported from England and planted in 1863, has attained the height of twenty-five feet. Unfortunately, this magnificent and highly valuable timber tree will not flourish in an exposed situation or in the vicinity of the sea, but it is admirably fitted to form large forests in our alpine glens, and in the cooler climate of our mountain regions. The timber of this species is of the highest value, and is extensively used in ship building and for spars—instance the tall flagstaff in the Royal Gardens at Kew, in England, 200 feet long.

Abies excelsa, the Norway spruce or spruce fir, is another of the species that demands more attention than it has received hitherto. I find specimens of this tree have grown at the rate of eighteen inches per annum for years in succession, and promise soon to be most ornamental and useful trees.

Abies Smithiana, planted in 1861, is now twenty feet high, and is one of the handsomest of the species, and, unlike many of its class, increases in beauty with size. The timber of this tree is excellent. In Northern India this noble tree rises to the height of 200 feet, feathered or branched to the ground, with a diameter of trunk five to six feet, forming splendid timber for railway sleepers and other purposes where strength is required. Abies pinsape, planted in 1863, has grown to fifteen feet in height. This species, although somewhat slower in growth than the above, forms a magnificent tree, attaining a height of seventy feet. The branches are dense and rigid, very symmetrical in habit; its compact growth and unique appearance recommends it to a place in ornamental plantations.

Cedrus Atlantica, planted in 1863, is now forty feet high, very symmetrical and handsome; diameter of trunk about fifteen inches. It is difficult to find distinctive characters for this and Cedrus Libani; the principal difference lies in the foliage, which in this species is shorter and of a glaucous silvery hue. The timber of this species is almost imperishable, and this tree is extensively planted in Britain for the value of its timber. It forms almost exclusively the arborescent vegetation of the upper plateau of the Atlas Mountains.

Cedrus Libani or Mount Lebanon cedar, raised from seeds imported from Syria in 1865, has grown to fully ten feet in height, thus showing, in opposition to the general supposition, that this species is slow in growth. Several trees raised from seeds at Flemington, and planted out at the same time, have reached an almost uniform growth of ten feet. One tree of this species planted in 1863, being at that time only six inches in height, is now about eight feet high. This tree was imported from England in 1862, along with 600 of the same species and of different sizes, and on arrival was the only living plant, the others having perished on the voyage, thus showing the risk of importing trees of this kind from a great distance.

Cedrus deodara, the sacred cedar of India, the timber of which is so much valued in Northern India for its strength and duration. Large numbers of young trees were raised from seeds imported in 1863 and planted out in 1865. Some of these have reached the height of twenty feet, well furnished with great expanse of branches. Some of these

trees, from exposure to prevailing winds, have frequently lost their leading shoot or top; but although this in a measure has retarded their upward tendency for a time, they have invariably made new leaders, and show more of the natural character of this species than is generally observed in young trees when growing in sheltered situations. This undoubtedly is one of the most elegant and graceful members of this beautiful order, and should be planted by hundreds of thousands throughout our alpine forests.

Cupressus Lambertiana (C. macrocarpa).—Large numbers of specimens raised from cuttings, and others raised from seeds, were planted throughout the grounds in a great variety of soils. These trees, in their early stages, grew up with great rapidity, and soon formed handsome specimens. Those on shallow soils, and particularly where clay or sandstone was in excess, have all succumbed to the drought of warm seasons, while those that were planted in deep sandy soil have grown with great luxuriance, and, where sufficient space has been allowed for them to expand their branches, are now extraordinary fine specimens. Several of those planted in 1861 have reached the height of upwards of fifty feet, with a trunk of nearly three feet in diameter, showing no signs of decay whatever. This is without doubt one of the most splendid ornamental trees for general planting, but it must not be crowded amongst others of the same order. The timber is excellent.

Cupressus Lawsoniana, imported from England in 1862, and planted out in 1863, has not made the progress here that younger trees of this species seem to make in other parts of the colony, and particularly about Ballarat and Daylesford and Mount Macedon. Numbers of this beautiful species were planted out in a variety of soils, none of which have attained to a height of more than twenty feet; this may be accounted for in a great measure by the fact that imported trees generally do not succeed so well as those raised from seed in the colony. Cupressus torulosa, a Himalayan species of cypress, planted in 1862, has outstripped many other species of the same age; several unique specimens, ranging in height from forty to fifty feet, are studded throughout the grounds, rearing their spiral tops and graceful forms above the ordinary species—one tree in particular, the variety C. Cashmeriana, or weeping cypress of travellers, is unequalled in the Australian colonies. The timber of this species is considered equal to that of the deodar for durability.

Cryptomeria Japonica, or Japan cedar, was planted here in large numbers early in 1861. During the succeeding years 1862 and 1863, during the dry summers, many of these trees suffered severely, and ultimately

a large number were removed, having become so unsightly in appearance; others were cut down and destroyed; a few dozen were left to chance in a sheltered situation, and pruned annually; these trees have made extraordinary growth, and now overtop a large pile of buildings they at one time helped to screen from view ; these trees are now fully forty feet in height. The timber is highly valued in China, and is much used for cabinet and other indoor work.

Grevillea robusta, the silk oak of Northern Queensland and Moreton Bay, where it forms a noble forest tree, and when in flower is highly ornamental. This tree, planted in large numbers in 1861, has grown into large timber. Several of the specimens are now sixty feet high, with a diameter of trunk fully eighteen inches, with a clean stem of several feet in length, furnishing at once a good supply of useful timber suitable for many purposes.

In the early part of 1863 a few packets of choice species of Pinus seeds were procured from England; from these some thousands of young trees were raised, which, when fit for removal, were distributed freely by Mr. Glass to many of his friends in Victoria and the neighboring colonies. The following year, 1864, hundreds of these young trees were planted on the Flemington estate, and in a few years became a veritable forest, as seen from a distance. Thinning out soon became necessary, and was done until hundreds of plants were transferred from Flemington to distant parts of the colony ; large areas of the adjoining fields were also planted with the thinnings out. Specimens of from ten to fifteen feet and more transplanted into new grounds produced an effect at once, and rapidly increased the area covered with trees from forty to sixty acres. Some of those transplanted trees at the present time show an altitude of thirty and forty feet, with a diameter of nearly two feet, hundreds showing an annual growth of not less than four feet since they have been removed.

A specimen of Pinus insignis, planted in 1862, shows an altitude of sixty-five feet, with a diameter of trunk three feet, and clean stem of at least thirty feet in length of excellent timber fit for the sawmill. This specimen can be seen from Hobson's Bay, and several parts of the surrounding country.

Trees of P. radiata, of nearly equal magnitude, with perhaps finer trunks of timber, are met with in several parts of these grounds, the annual deposit of spines or leaves underneath having accumulated to a depth of eight or ten inches at least, recalling to memory the noble forests of pine met with in many parts of North Britain and the continent of Europe. During the past year or two it has been found necessary

to use the axe freely amongst these plantations; better perhaps this operation had been done sooner and less severely; however, it was indispensably necessary, and I am pleased to see it still being carried out where it is most required.

The timber thus thinned out is being used for firewood, and will well repay the cost of labor. Amongst the thinnings out of a part of these plantations I observed logs and sections of Pinus pinaster and Cupressus Lambertiana being cut up for firewood, that measured fully twenty inches in diameter. These specimens have been cut down to make room for choicer kinds growing in close proximity, and which are intended to be permanent. Pinus Sabiniana, imported from England in 1862, are now forty-five and fifty feet in height. To judge by the growth of the last few years, this noble tree promises to become as famous for ornament as it is in its native habitats in California.

Associated with Sabiniana, here, as in its native forests, are to be seen Pinus macrocarpa, and P. Lambertiana, a section of the long-leaved glaucous species, with immensely large cones. Lambertiana was raised from seeds imported in 1863, and now stands twenty-five feet in height, with exceedingly robust habit and very beautiful foliage. Pinus filifolia, planted in 1862, is one of the long-leaved species from Guatemala. This species has grown to about thirty feet high, and although not very symmetrical in growth, like most of the Mexican species of conifers, the spreading branches and long foliage render its appearance very beautiful, as seen in the height of summer, when the outline of its foliage presents the appearance of the silvery spray from a beautiful fountain.

Pinus Montezuma, planted at the same time as the last, has grown to the same height, and forms an exceedingly handsome tree, with ample foliage; but, like filifolia, is somewhat irregular in habit of growth, with very rough bark, particularly on the young wood; the timber is of the very best description, very resinous and durable. This species very much resembles P. longifolia, when in a young state, and I have no doubt will form one of our best pines for the extraction of tar and turpentine.

Pinus ponderosa, imported in 1863 and planted in 1864, have attained the height of twenty feet, with a diameter of stem fifteen inches; this tree although not so rapid in growth as some of the species from North-west America, promises, from its robust annual growth and clean trunk, to be one of our very best trees for forest culture in certain districts of Victoria. In Vancouver's Island, this fine timber tree rises to upwards of 100 feet, with a diameter of five feet, and frequently more; its timber is of the highest value, very resinous and free from knots, a great

portion of the trunk being free from branches. Pinus Cragiana, and P. Beardsleyii, imported at the same time and planted side by side, I find to be identical with ponderosa.

Pinus tuberculata, planted in 1863, is now twenty-five feet high, with a diameter of ten inches, with dense top of close branches, and bright green leaves, rather above the average length. This species, although of comparatively slow growth, grows well on poor soil, and, from its resinous nature, will be found useful for tar and other products. A tree that is well suited for planting near the sea, being found in large forests on the sea-coast to the south of Monterey, in California, frequently close to the beach and within the influence of sea spray.

Pinus muricata, raised from seed in 1864, is now twenty-five feet high, with a diameter of trunk twelve inches. This very distinct pine in its young state resembles Pinus insignis, and is often confounded with it for the first few years, after which it assumes a quite distinct habit of growth. It is also from California, where it is frequently met with in Upper California associated with insignis. Mr. Hartney met with a small forest of this tree at an elevation of 3,000 feet. Mr. Jeffrey also subsequently met with it on the Siskyon Mountains, at an elevation of 7,500 feet, where it formed a handsome conical tree of forty feet in height. I believe this will be found a most useful tree for our alpine forests, when seeds in quantity can be procured and disseminated in such localities.

Pinus halepensis, or Aleppo pine, planted in 1862, is now fifty feet high, with diameter of trunk fully two feet. Large numbers of this useful pine have been planted in different soils and at different times, chiefly to form shelter, and have been found to withstand the heat and drought of summer fully as well as any of the species.

Pinus pinaster, one of our commonest pines, deserves more attention at the hands of the planter. Large numbers of this species were introduced into these grounds for the purpose of shelter, some of which have singled out for themselves permanent places. Some of those planted in 1860 have reached the height of fifty feet, with diameter of branches and trunk in proportion. Where this tree has been allowed sufficient space to develop its habit, and expand its branches, and attended to by judicious pruning in its early stages, it, in a very few years, will become valuable for its timber. Numerous specimens of this tree have been cut down, to make room for rarer kinds, which, if carefully cut and sawn into boards, would well have repaid the labor and expense attending their growth. Large specimens of this species are not unfrequently met with in various parts of this colony, planted by early settlers.

Pinus sylvestris, the Scotch pine, planted in 1860, has grown to about twenty feet, with a diameter of trunk ten inches. This species, like all trees which have extensive geographical range, will grow on almost any kind of soil, but in Victoria, as a rule, it is never found to do well lower than from 1,500 to 2,000 feet above the sea. The varieties of this species are numerous, and with very distinct habit, such as the P. sylvestris, horizontalis, the timber of which is much superior in quality to the ordinary species.

Pinus pinea, the stone pine or parasol pine, planted in 1860, generally is considered a slow-growing tree. Specimens of this species have reached the height of thirty-five feet, and diameter of trunk two feet. This tree is remarkable for its round head and intense green foliage. Specimens of this species, planted at Moonee Ponds in 1858, have attained the height of fifty feet, with diameter of trunk three feet six inches, and form very handsome specimens.

Pinus rigida, the pitch pine of America, planted in 1864, is now upwards of twenty feet in height, showing that although somewhat slow in growth when young, yet in favorable situations it soon attains a fair size.

Pinus laricio, or Corsican pine, planted in stiff clay soil in 1862, has attained the height of twenty-five feet, and diameter of trunk ten inches. This species in appearance resembles P. sylvestris, but is very variable, many specimens appearing to be entirely distinct; the true species, instead of the leaves being erect, are spreading and curved or wavy; in a young state it is not easy to detect the difference.

Pinus Austriaca, growing in close proximity to the last, and planted at the same time, has also attained to twenty-five feet, some specimens being exceedingly handsome. This species is perhaps the best of this section for bleak, exposed situations, and for affording shelter to less robust kinds.

Pinus Brutia, the Calabrian cluster pine. Seeds of this species were received from England in 1862, from which plants were raised and planted out in 1864; these have now reached the height of twenty feet, with large spread of branches. This tree for several years seemed to be identical with halepensis—the Aleppo pine; but now that it is showing cones, it is easily distinguishable from that species in its cones being stalkless and in large clusters, and in the leaves being nearly double the length.

Numbers of new and rare species of coniferous trees have been planted at different times subsequent to the above list, the growth of which no doubt will be interesting for data at some future time.

Sufficient, however, has been gained to convince the most sceptical that exotic trees of certain species can be grown successfully and with profit, where judicious care and attention is bestowed upon their cultivation.

The public gardens of Ballarat, Geelong, Castlemaine, and Sandhurst afford abundant proof of these several localities being suitable for the growth of exotic timber trees. In private gardens, in each of these localities, numerous examples of rapid growth may be observed, and especially in the grounds attached to the residence of the late Mr. J. Winter, near Ballarat, where a once valuable goldfield has been turned into a magnificent plantation of exotic trees, an example which cannot be too highly commended to gentlemen having waste lands lying idle in the same locality. The whole of these plantations were planted by their owner about twelve years since, and at the present time hundreds of exotic trees can be seen rearing their graceful tops to an altitude of more than fifty feet, with every prospect of doubling that height within the next ten years ; Wellingtonias, Deodaras, Abies, Pinus, and a host of others, towering to an altitude never attained within the same number of years either in Europe or America, and rarely to be seen in this colony.

The grounds of public institutions in and around Ballarat bear testimony to the rapid growth of exotic trees when placed under the superintendence of practical men. The Water Commissioners of Ballarat have set a noble example with regard to planting non-indigenous trees, which, if followed by similar bodies in other parts of the colony, cannot but be productive of the greatest benefit to mankind. The example set by the Water Commission is noble in the extreme, and, when carried out, as it must be now that it has been begun, to the extent contemplated by that body, the result will be grand ; the riches of a country is nothing in comparison with a plentiful supply of water to its inhabitants, and the Ballarat Water Commissioners are setting about providing this for the inhabitants of their populous city in a sensible and practical manner.

Numerous other instances might be cited where private enterprise has done much towards solving the question of whether exotic trees can be grown to the same perfection, either for ornament or utility, as in older countries. I would here refer to the delightful grounds of Mr. Stanbridge, at Daylesford.

This gentleman, many years ago, seeing the success attending planting of exotic trees in other districts, set about planting a number of the choicest kinds procurable at that time. Amongst these are to be seen fine examples of Araucarias of different species, Cedrus deodara,

Cupressus Lawsoniana, Wellingtonia gigantea, Pinus insignis, Ulmus campestris, Quercus robur, Platanus, and other European timber trees, growing as vigorously and robust as could be desired. Noble specimens of olives grow side by side with lovely camellias of gigantic size and exquisite beauty. The climate of Daylesford appears admirably adapted for the growth of many species of exotic trees, as may be seen by the rapid growth of those planted in the reserves around Wombat Hill and elsewhere in the district.

In the Stawell district exotic trees grow with remarkable rapidity. Side by side with the bluegum will be seen the Wellingtonia gigantea, Pinus insignis, P. Austriaca, and P. sylvestris, growing with a vigor rarely to be seen in the districts near Melbourne. Many non-indigenous trees are to be seen associated together in the Stawell district, and particularly in and around the town, that are rarely seen in other localities. In the private garden of Mr. McMillan, at Glenwylln, many species of coniferous and other exotic trees have attained considerable proportions. Araucarias of several species and Pinus of various kinds seem quite at home. The soil in this district is well suited for the growth of non-indigenous timber.

Numerous examples of the rapid growth of exotic trees can be seen in the public gardens at Geelong, where many species of Pinus have attained to the dimensions of useful timber.

In the dusty streets and arid district of Sandhurst splendid specimens of exotic trees can be seen, most of which are comparatively young; most of them having been planted within the last fifteen or twenty years, many more recently. Oaks, elms, ash, planes, pines, and other exotic trees flourish, and grow with a luxuriance seldom to be met with even in Europe.

The public gardens at Castlemaine, having been formerly a worked-out goldfield, the most of the soil is composed of a poor gravelly loam mixed with quartz and ironstone gravel. The trees in these gardens, planted only some ten or twelve years ago, have made extraordinary growth, some of the pines having reached to the height of forty and fifty feet. Oaks, elms, and other deciduous trees, generally, have grown amazingly, and already afford ample shade under their spreading branches.

Elm trees planted in the streets and Castlemaine market-place will bear favorable comparison for their age with the same species planted in the cities on the continent of Europe.

Kyneton also can boast of its exotic trees, good examples of which can be seen in the public gardens, and occasionally around the residence

of private gentlemen. Some fine specimens of Quercus robur, var. pedunculata, overshadow the footways in some parts of the town, forming a pleasing contrast in spring and autumn to the monotonous bluegum and sombre pine, so much used in street ornamentation. The growth of exotic trees in the several public gardens around Melbourne, where ordinary care has been bestowed upon the preparation of the ground for their reception, is proof sufficient of their value when properly cared for and due attention paid to their cultivation. Here the careful student of nature may learn many a useful lesson.

A few months ago I had the pleasure of inspecting a plantation of walnut and chestnut, planted in rich alluvial soil on the eastern slope of Mount Macedon by Mr. J. Snowball, about seven years since. Many of these trees have reached the height of eighteen and twenty feet, full of vigor and making rapid growth. This plantation is planted with the view of the value of these timbers hereafter; in the meantime the value of their fruit will far more than repay the original outlay. Other examples of the rapid growth of many species of exotic trees can be seen in many parts of Victoria, which leave no doubt on my mind of the fitness of our climate in many localities for the growth of many species of exotic timber but yet sparingly grown, from a want of the knowledge of their value and usefulness.

I have, &c.,

WILLIAM FERGUSON,

Inspector of State Forests,

A. R. Wallis, Esq.,

Secretary for Agriculture.

AGRICULTURAL INVENTIONS PATENTED OR DEPOSITED AT THE PATENT OFFICE DURING 1874.

Patent and Copyright Office, Registrar-General's Dapartment,
Swanston street north, Melbourne, 6th September 1875.

SIR,

I have the honor to report to you upon the subject of inventions connected with agriculture which have been patented during 1874, as well as of those applications which have lapsed in the absence of the necessary procedure prescribed by the Patents Statute.

Of patents granted or applied for in Victoria during the year 1874 and directly relating to agriculture, two were for improvements in the preparation of manures; nine for reaping, binding, and harvesting machinery; two for threshing and winnowing; one for fencing; and two for the trapping or destruction of obnoxious animals, vermin, &c.

Of patents indirectly connected with agriculture, six were for shearing and marking sheep and other animals; two for washing and cleansing wool, &c.; one for presses adapted for packing wool and other fibrous substances; one for a new method of shoeing horses; one for an improved kind of horse-bedding; two for excavating; two for the preparation of bark and the extraction of tannin; and seven for processes connected with the preservation of food.

The nature of the various inventions specified will be seen from the following brief descriptions under the headings and in the order as above given.

Diagrammatic sketches illustrative of the text, and taken from the original drawings or the models deposited with the specifications, are appended in many instances.

Information relative to the granting or not granting, as well as the dates of the patents enumerated, will be found at the end of each description.

MANURES.

1896. William Smith Amies, Guernsey, Channel Islands.—"Improvements in artificial manures."

The ingredients used in manufacturing this manure are sulphate of iron, and carbon in the shape of stone-coal, and vegetable or animal charcoal. The proportions of these are—

For No. 1. One part carbon, one part sulphate of iron.
2. Two „ one „ „
3. Three „ one „ „
4. Four „ one „ „
5. Five „ one „ „
6. Six „ one „ „

The ingredients are pulverized and mixed. The sulphate of iron may be added in a liquid state. If desirable, the manure may be mixed with sand, earth, or ashes.—8th April 1874. (Patent granted.)

1930. Ludwig Rummell, of St. Kilda, county of Bourke, analytical chemist.—"An improved method of utilizing blood, and manufacturing therefrom albumen and animal guano, or animal charcoal and ferrocyanide of potassium."

The blood is collected and allowed to coagulate; it is then placed in a rapidly-revolving cylinder, the centrifugal action of which causes the solid to separate from the liquid portion of the blood, the former adhering in a kind of crust to the cylinder, whilst the latter as a clear liquor occupies the centre, from which it may be drawn off. When the solid portion is properly dried, it forms a product rich in nitrogen, which may be used for manure, &c. The liquid is pure albumen, and may be used in its normal state, or dried at a temperature not exceeding 140° Faht.—7th July 1874. (This application lapsed in the absence of the necessary procedure.)

Reaping, Binding, and Harvesting.

1862. William Tyrrell Evans, gentleman, and William Robert Merry, civil engineer, of Newham.—"A reaping and binding machine." The contrivances are shown on Plate I.

These consist of an endless web, which takes the cut grain, as it falls from the knives, and carries the same to the binding-tray, upon which are placed the bands. By a simple pressure of the foot upon a lever two arms are made to rise through a slit in the binding-tray and collect the cut grain into a sheaf; at the same time another lever is made to rise and bring the band or thread attached to it within reach of the attendant's hand. The pressure being taken from the lever, the arms fall back, and the sheaf being removed, the binding-tray is ready for a fresh supply.—2nd January 1874. (Patent granted.)

1867. Edwin Roberts, of No. 4 Capel street, West Melbourne, millwright, and James Hutchins, No. 247 Elizabeth street, Melbourne, agricultural implement maker.—"An improved binding apparatus for attachment to reaping-machines."—(Plate ii.)

The cut corn is delivered by an elevator on to a table, in which is a slot through which work two curved arms, made to act by two pair of chain-wheels, as shown in the drawing. The chains carry a spindle having forks upon it for twisting the band, the material for which is obtained from a box fixed under the table. The necessary rotating motion is given to the spindle by two pinions travelling in racks within the frame. Immediately the band is formed, the two ends of it are lifted by two forks, one at the end of each of two semicircular arms. These work through a slot in the table, and hold up the two ends of the band to be twisted together in any approved manner. The sheaf being thus formed, is immediately released by drawing back the near arm, whilst the off one moves forward, making a complete revolution on its own axis, and takes up its place again beneath the slot ready for the next sheaf. This drawing back of the near-side arm sets the binding machinery again in motion, and the operation is commenced afresh upon the new sheaf, which by this time has been deposited on the table.—14th January 1874. (Patent granted.)

1878. George Roy, Bung Bong, near Maryborough.—"Improvements in reaping-machines."—(Plate iii.)

(1.) Two lines of travel are provided for the guidance of the rakers in their passage over the platforms, so as to make them act either as rakers or gatherers. (2.) The cam, *A*, is peculiarly constructed, with an entrance, *B*, and an exit, *C*. (3.) The spring-catch, *G*, spring, *E*, connecting rods, *FF*, are used in connection with adjustable lugs, *I*, for opening and closing the entrance to the inner line of travel on the cam. (4.) The cord, *H*, is operated by the foot of the driver. (5.) The pole is adjusted as shown in Fig. 6; the spring-pawl is shown in Fig 7; and the method of throwing the knife-bar in and out of gear in Fig. 8.—18th February 1874. (Patent granted.)

1892. William Tyrrell Evans, gentleman, and William Robert Merry, civil engineer, both of Newham, county of Bourke.—"An invention for harvesting flax."—(Plate iv.)

The knife-bar and knives of an ordinary reaping-machine are replaced by a series of conical rollers, *c. c. c.*, those of each pair revolving in opposite directions. The flax is gathered by the guides, *b. b. b.*, and the fan, *a. a.*, having been pulled out of the ground, it falls upon the movable platform *d*, which is then swung round by the chain or rollers

e, and the flax is delivered on to the binding-stage *i. i.* The curved bar *h* is then made to rise by the action of the foot of the operator, and the flax is retained to be bound or otherwise disposed of.—31st March 1874. (Patent granted.)

1909. Benjamin Colvill Ashenden, Talbot, carpenter and joiner.—"An automatic and mechanical reaper and binder combined."

There are no drawings to illustrate this specification, and no amended description was ever lodged. It is therefore not very easy to discover the real nature of the invention. It appears, however, to consist of an arrangement of belts for delivering the cut corn on to the binding-table, where it is grasped by curved claws, which pass the binding-string round the sheaf and fix the same by twisting it into the sheaf.—28th May 1874. (This application lapsed in the absence of the necessary procedure.)

1910. Benjamin Colvill Ashenden, Daylesford, Talbot, carpenter and joiner.—"A mechanical reaper and binder."

The cut corn is delivered on to the binding-table by a tip-board. It is then clasped by springs working through slots on the binding-table. As there is no drawing to illustrate the specification, the above description must be considered as only approximately correct.—28th May 1874. (This application lapsed in the absence of the necessary procedure.)

1941. Thomas Harvey, of Preston, Victoria, builder.—"Improvements in machines for reaping and binding."—(Plate v.)

The cut corn falls upon a table, along which and up an inclined plane it is propelled by a series of rakes, working in grooves, and projecting out upon the table through slots. The sheaf is then gathered into the binding receptacle beneath *K.K.*, and the binding-string being passed round it, the two ends of the string are fastened by pads stitched together by a needle working on the principle of the sewing-machine. —23rd July 1874. (Patent granted.)

1962. John Alsop, South Muckleford, shire of Maldon, Victoria.—"An invention for binding made easy."

As there is no drawing attached to the specification, it is difficult to state the nature of this invention precisely. It appears, however, to consist of a raised platform upon which the cut corn is deposited by a tilt-board receiving the corn from the cutting part of the machine.

Running in grooves on the platform is a "grip" which is closed by means of a rope working on pulleys and opened by elastic springs. This "grip" presses the loose sheaf, which is bound by two binders seated opposite to each other, beside the platform.—23rd September 1874. (This application lapsed in the absence of the necessary procedure.)

1968. George Andrew Bramston, blacksmith, Eldorado, Ovens and Murray District, Victoria.—"An improved platform-wheel for reaping-machines."

The rim of the wheel being half-round, allows of it accommodating itself to any pitch; and the centre being movable, allows of its being replaced at a nominal cost.—7th October 1874. (This application lapsed in the absence of the necessary procedure.)

Threshing and Winnowing.

1929. John Alsop, of Muckleford, shire of Maldon, Victoria.—"An invention for simplifying the process of threshing and winnowing."

The cord is introduced to this machine where it is bagged in the old machines. A drum revolving at a slow speed forces the corn and straw to the top of an enclosed passage, where an elevating and riddling belt works upon rollers with an undulating motion. The straw then slides down a screen in which are drum riddles, which the weight of the straw causes to revolve. The straw then falls on to a net, and is there bound up and lifted on to the stack. The corn is lifted by an elevator about sixteen feet into the winnowing-machine, whence it descends down a screen through a smut-blower into the bags.—4th July 1874. (This application lapsed in the absence of the necessary procedure.)

1963. Petrus Lambertus Alkemade, Arundel street, Benalla, Victoria, builder.—"Improvements in winnowing-machines."—(Plate vi.)

The corn is placed in a hopper, the discharge at the bottom of which is regulated by a series of fingers, to which an intermittent motion is given. The corn then falls upon an elevator, which raises it and allows it to drop upon screens arranged after the manner of louvre boards at the back of the machine. During the passage over these, it is subjected to a blast from the blower, and falls into a concave screen made to vibrate upon suspending rods. Finally it runs down a screen arranged at an angle, and escapes on to the floor or into a receptacle placed to receive it.—25th September 1874. (Patent granted.)

Fencing.

1999. William Rigg, wholesale and retail ironmonger, 69 Elizabeth street, Melbourne.—"Improvements in wire-fencing."

The wire is made of the best kind of metal, so that it may be as light as possible without an undue sacrifice of strength. It is also used of an oval form in section. Stretchers formed of perforated pieces of corrugated iron are placed at intervals between the posts to keep the wires in their proper positions.—5th December 1874. (Patent granted.)

Trapping and Destroying Animals, Vermin, etc.

1869. William Mentiplay, of Rouse street, Sandridge, salesman.—"An improved method of trapping rabbits."

A large hole is made in the ground; over this are placed three traps, each consisting of a plate of wood or other suitable material, supported near the middle by a piece of thick wire in such a way that either end will give way as soon as any weight is made to bear upon it. Upon the rabbits falling into the hole the plate of wood is made to rebound by a piece of elastic.—15th January 1874. (Application lapsed in the absence of the necessary procedure.)

1996. William Henry Parker, 59 Gertrude street, Fitzroy, near Melbourne.—"An improved method of and apparatus for destroying insects and other vermin."

Steam medicated with carbolic acid is generated in a suitable apparatus, and ejected upon the plants, &c., infested with vermin. The apparatus used consists of a portable boiler, having a small furnace within it, and a flexible tube or nozzle for directing the jet.—27th November 1874. (Patent granted.)

Shearing and Marking Sheep and other Animals.

1865. David Brown, of Glencoe, near Mount Gambier, South Australia, sheep-farmer, and James Fulton, of Greville street, Prahran, near Melbourne, engineer.—"An improvement in sheep-shears."

The shears are made in three pieces, as shown in the drawings (Plate vii., Figs. 1, 2, 3, and 4), the cutting part being fixed to the handle by means of screws.—6th January 1874. (Patent granted.)

1907. John Mackenzie and David Hill Dow, Freshwater Creek, county of Grant, sheep-farmers.—"Improvements in the process of sheep-washing for sheep-shearing."

The sheep enter from the hot-soak tank into a revolving cylinder, of about four feet in diameter. A frame divides the cylinder into two parts. There is a platform in the interior, which allows the sheep to fall into the washing shoot. The cylinder is made to revolve by a capstan, and one sheep remaining in the cylinder acts as a decoy for the rest.—26th May 1874. (This application lapsed in the absence of the necessary procedure.)

1936. William Organ Willis, 31 Little Collins street west, whitesmith.—"An improvement in punches for marking the ears of sheep, and for other analogous purposes."—(Plate vii., Fig. 5.)

A guard surrounding the punch acts by means of a spring to remove the ear of the sheep after the hole has been cut through it.—17th July 1874. (Patent granted.)

1969. William Clark, of 232 Oxford street, Middlesex, Great Britain.—"Improvements in the apparatus employed for clipping and shearing horses or other animals."—(Plate viii.)

The movable and fixed parts of the shears are made to press tightly upon each other by the springs *a a*. In certain forms of the shears employed motion is given to the movable comb by means of the arrangements shown in Fig. 10 and Fig. 11. In the former, provision is made for driving the shears by the action of a band and pulley.—7th October 1874. (This application lapsed in the absence of the necessary procedure.)

1975. John Johnston Smart, Melbourne, gentleman.—"A machine for making metal labels for cattle and sheep."

The labels are cut out of a strip of metal by a stamp, they are also numbered consecutively, as formed, by three or more rollers having figures upon them to represent respectively units, tens, hundreds, &c.—17th October 1874. (Patent granted.)

1976. John Johnston Smart, Melbourne, gentleman.—"An improved sheep and cattle label."

The labels consist of strips of thin metal having a name or number stamped upon them; these are put through slits punched in the ears of sheep or cattle, and being bent, are firmly fixed in the required position. —17th October 1874. (Patent granted.)

Washing and Cleansing Wool, etc.

1916. Whaley Bouchier Nutt, of Lansdowne terrace, St. Kilda, near Melbourne, merchant.—"A new solution for cleaning and scouring wool and other fibres and fabrics."

The cleansing solution used is made by adding one measure of silicate of soda (silica, 27·8; alumina, ·5; soda, 17·7; water, 54) to seventy-two measures of boiling water. The wool to be treated is first immersed in cold water for ten or fifteen minutes, then transferred to the solution and well stirred whilst in it, and afterwards returned to the cold water, where it is rinsed previous to drying.—9th June 1874. (This application lapsed in the absence of the necessary procedure.)

2000. Reginald Scaife, 11 Moorgate street, London, gentleman.—"Improvements in the method of and means for extracting oleaginous, fatty, and resinous matter from textile materials, whether animal or vegetable, and from other substances."

The substances to be operated upon are placed in a closed vessel and subjected to the influence of the vapor of alcohol, wood-spirit, or naphtha, bisulphide of carbon, ether, &c. After the oleaginous matter has been fully extracted, steam is passed through the vessel, in order to remove the last traces of the vapors employed.—14th December 1874.

Presses.

1949. Robert Fulton, of the Yarra Bank, Melbourne, iron-founder.—"Improvements in presses for wool and other compressible material."—(Plate ix.)

The press consists of an upper box and a lower one. The upper box can be swung round on hinges, so that it may be removed to be filled whilst the pack is being bound in the lower box.—6th August 1874. (Patent granted.)

Shoeing Horses.

1877. David Hutcheson, 115 Madeline street, Carlton, blacksmith, for "An improved method of constructing and affixing shoes to the hoofs of horses."

A number of dove-tailed slots are made in the solid walls of the hoof; a series of metal dove-tails fit into these slots, and the shoe is affixed thereto by split metal shanks, which pass through slots in the shoe and are fixed by driving wedges into the split portion.—17th February 1875. (This application lapsed in the absence of the necessary procedure.)

Horse-bedding.

1920. George Edward Lauder, of Bank street, Emerald Hill, Victoria, riding-master.—"A new and improved bedding for horses and other cattle."

Powdered tan, sawdust, shavings, &c., are mixed with chloride of lime.—18th June 1874. (Patent granted.)

Excavating.

1883. William Lockhart Morton, of Caroline street, South Yarra, gentleman.—"Excavating reservoirs, tanks, or canals, or for sinking wells by steam-power or any other power."

A chain to which steel points are affixed is made to be drawn over the ground to be excavated by two movable drums; the earth loosened by the steel points is drawn up an incline. The cutting thus made is in the shape of an inverted semicircular arch. When one section is completed, the drums and chain are shifted sideways, so as to commence

the cutting out of another section.—8th March 1874. (This application lapsed in the absence of the necessary procedure.)

1886. Samuel McCaughey, Coonong, Urana, New South Wales.—"Improvements in excavating machines."—(Plate x.)

An excavating tool is supported at an angle in front of the carriage. The earth excavated is then taken up by an elevator into a receptacle at the back of the carriage.—20th March 1874. (Patent granted.)

Bark and Tannin.

1984. Edmund Taylor, St. Albans, near Geelong, Victoria, contractor.—"Improvements in the preparation of tannin."

The tannin is extracted upon the spot where the trees grow. To accomplish this, the trees are placed in underground tanks lined with copper, and containing a coiled pipe or worm for heating the tanks by means of steam. The extract thus obtained is subsequently concentrated by evaporation, and packed in casks.—4th November 1875. (This application lapsed in absence of the necessary procedure.)

2006. Thomas Pearce, Flemington Bridge, Royal Park, Melbourne, engineer.—"Improvements in machinery for breaking, grinding, and crushing bark, wood, seeds, and grains."

The materials are broken between two sets of crushing rollers; the peculiarity being that the rollers on one shaft are larger than those on the other, the faces of the rollers being grooved. The grinding machinery consists of a conical drum, having upon its surface a number of serrations or knives, and revolving within a space the inner surface of which is also serrated.—24th December 1874. (Patent granted.)

Preservation of Food.

1884. Eugene Dominique Nicolle and Thomas Sutcliffe Mort, both of Sydney, New South Wales.—"An improved process for the preservation of food and other perishable substances by means of artificial refrigeration."

The meat, &c., is placed in air-tight cases and exposed for a greater or less time to an extreme degree of cold. By this means the putrescent germs are destroyed, and the articles do not decay as long as they are kept from contact with the air.—17th March 1874. (Patent granted.)

1913. Edward Waters, International Patent Office, Melbourne, patent agent.—"Improvements in the means and apparatus for preserving animal and vegetable substances."

The articles to be preserved are first partially desiccated. They are then placed in air-tight vessels and subjected to a current of heated air and sulphurous acid. After this the vessels are closed completely, and kept, or not, at a temperature of thirty-two degrees.—3rd June 1874. (Patent granted.)

1934. Gustav Tucholsky, 94 Lonsdale street west, Melbourne.—"Improvements in the preservation of meat, poultry, and fish."

The meat is first immersed in a solution consisting of sixteen gallons of cold water, two pounds chloride of aluminum, one pound pulverized borax, and two pounds pulverized saltpetre.

It is then thoroughly dried, either in the open air or in a room heated by steam-pipes; and subsequently enveloped in a wrapper prepared by painting over coarse calico with a composition formed by mixing together one pound of stearine, one pound of paraffine, and one-twentieth of an ounce of carbolic acid.—16th July 1874. (Patent granted.)

1942. Pierre Paul Egide Marie Koch, Anvers, Belgium, at present residing at Charing Cross Hotel, Middlesex.—"Improvements in preserving meat and other articles of food."

The meat, freshly killed, is cut into pieces and placed upon wicker hurdles and powdered with a mixture of phosphate of soda (one part), and bisulphite of soda (two parts), in the proportion of seven parts of the mixture to one hundred parts of meat. The meat and the hurdle are then placed in a vessel capable of being hermetically closed, the air is exhausted, and afterwards deoxygenized air is admitted under pressure. Subsequently the meat is packed in tin boxes or other well-closed vessels.—24th July 1874. (Patent granted.)

1964. Frederick Raven, Maribyrnong, near Flemington.—"An invention for the preservation of meat or fish."

The meat, previously cut into pieces of from four to eight pounds in weight, is suspended in air-tight vessels, at the bottom of which are placed some spirits of wine for twenty-four hours. The same is then immersed in a bath of fat or water, containing five per cent. of common salt, at a temperature of 144° raised to 167° Faht. for from six to eight hours; it is afterwards packed in tin vessels, &c., with or without jelly containing four per cent. of salt, steamed for from twenty minutes to one hour, and from two to three per cent. of spirits of wine being added. The tins are closed immediately.—28th September 1874. (Patent granted.)

2002. William Henry Parker, of Melbourne, millwright.—"An invention for preserving and cooking meats, fish, fruits, and vegetables."

The articles to be preserved or cooked are placed in closed vessels, the air being driven out by the admission of steam from a boiler; when this is accomplished, and the whole is sufficiently cooked, the tubes are closed as speedily as possible, so as to prevent the entrance of air into the vacuum that has been formed.—22nd December 1874. (Patent granted.)

2004. William Hubert Edwards, Swanston street, Melbourne, journalist.—"An improved process of preserving animal and vegetable substances."

The animal substances are first subjected for about an hour to a preliminary steaming in a solution composed of water, eighty parts, common salt, ten parts, and glyceric acid (carbolate of glycerine). They are then taken out, allowed to drain, wrapped in cheese-cloth previously dipped in the solution, and then wrung out and packed in barrels or air-tight cases with alternate layers of pounded charcoal, saturated with water containing ten per cent. of phenic acid—or the same are placed in barrels, and these being headed up are filled through a hole with the solution, which is then raised by steam to the boiling point—after which the barrels are closed up.

Vegetable substances are first steamed so as to shrink them, after which they are packed in proper barrels, cases, bottles, &c., and these being filled up with a boiling solution of twenty per cent. of glycerine, and $\frac{1}{500}$ phenic acid. The bottles, &c., are then hermetically closed.—2nd December 1874. (Patent granted.)

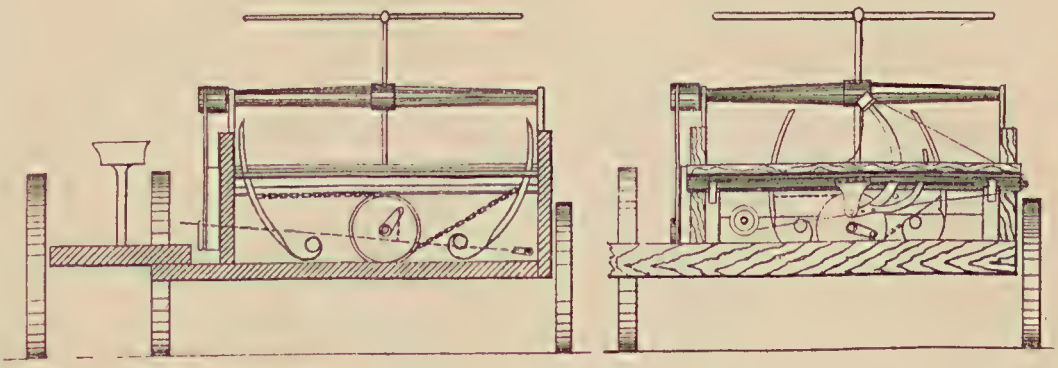
I have the honor, in conclusion, to point out that the original specifications of all inventions for which letters patent have been applied for, with the drawings and models deposited therewith, can be seen at the Patent Office, where also the printed indexes published by the Patent Branch of this department can be inspected.

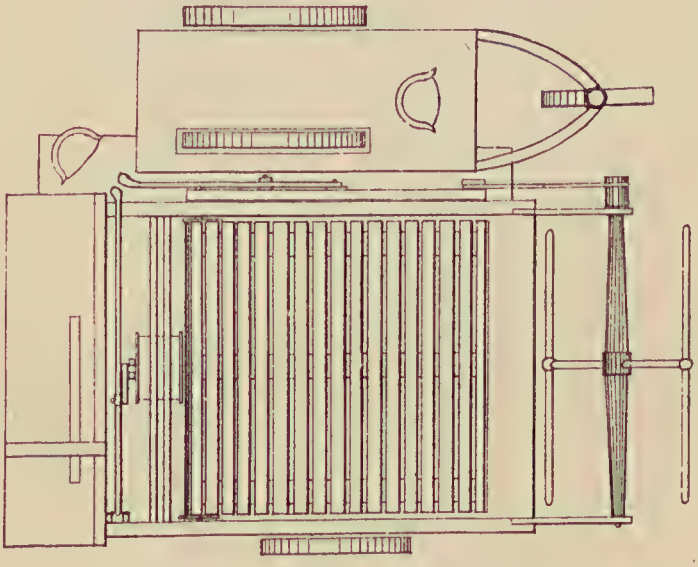
I have the honor to be, Sir,
Your most obedient servant,

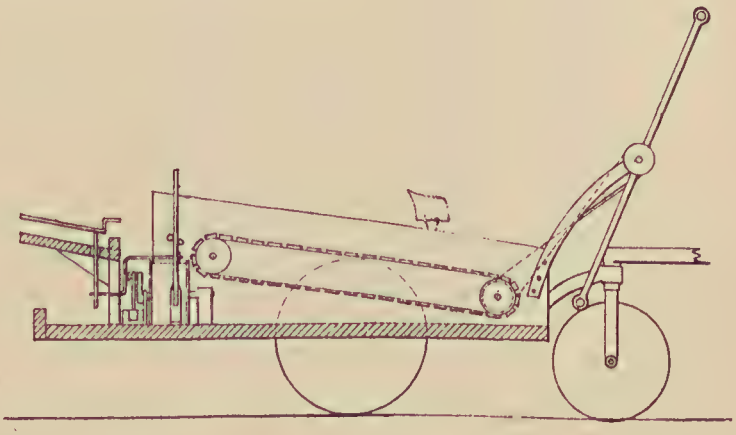
RICHD. GIBBS,
Registrar-General.

The Honorable the Minister of Agriculture,
&c., &c., &c.

PLATE I







T. Harrison del.

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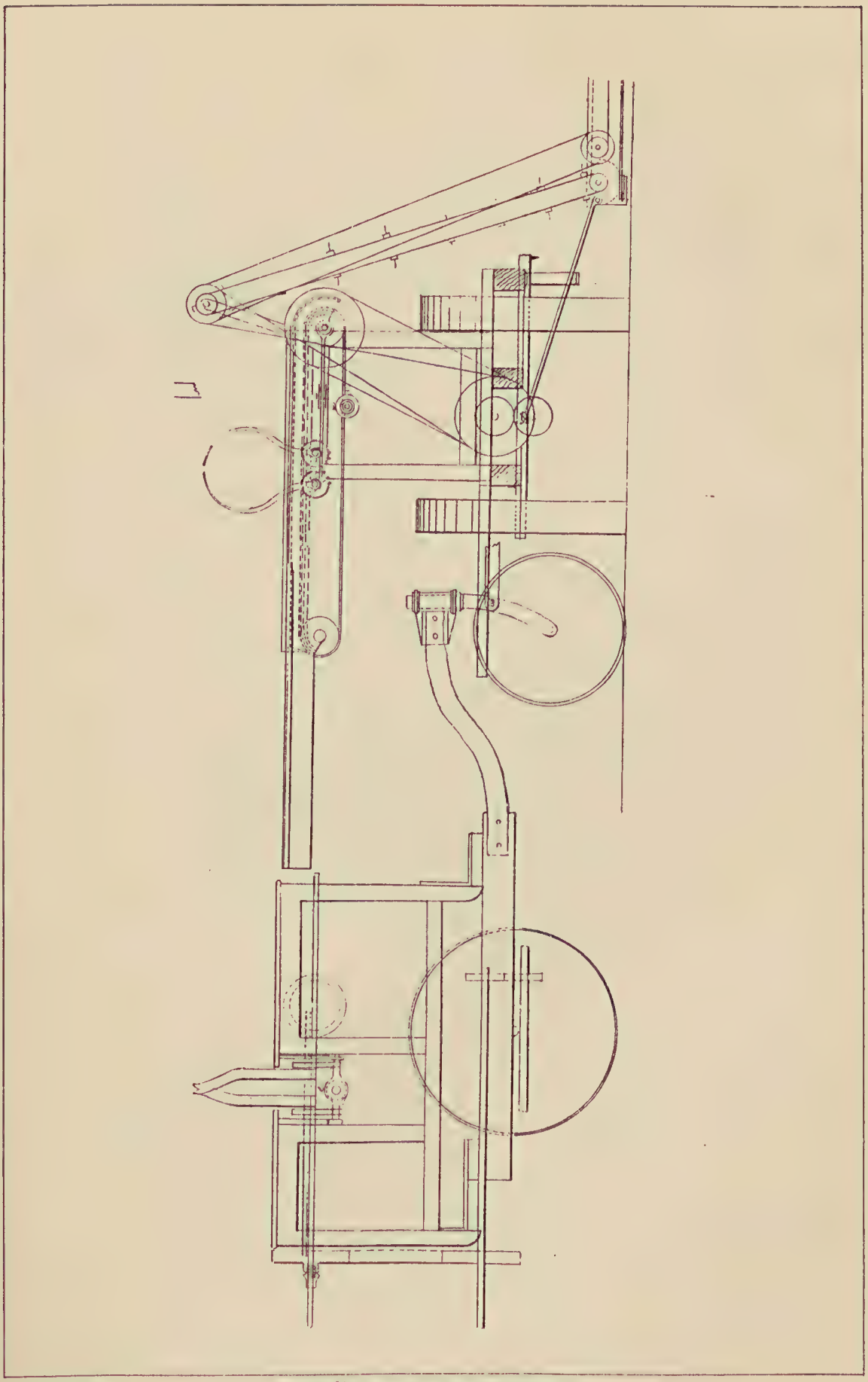
PLATE II



G. G. McCrae del.

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PLATE III

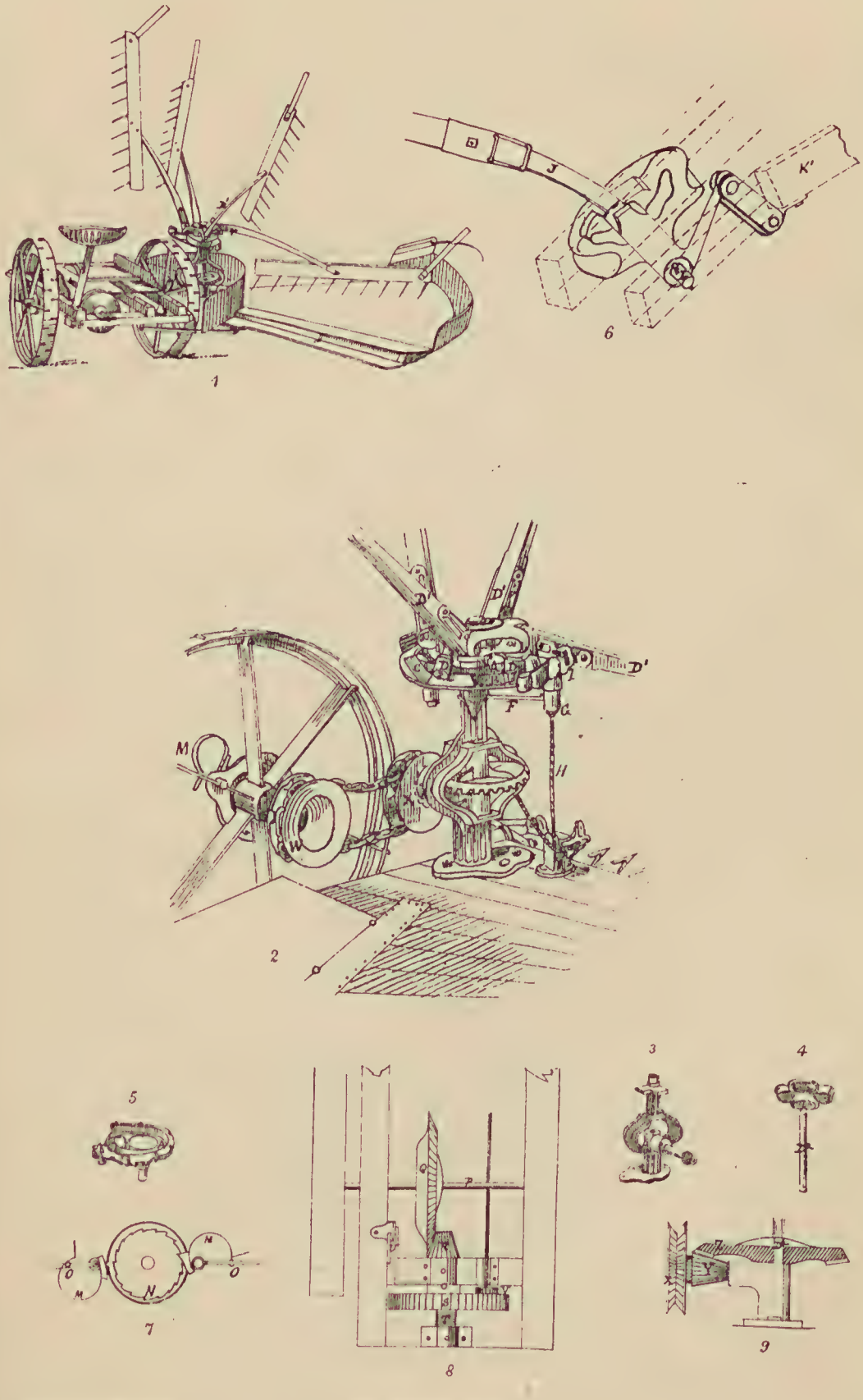

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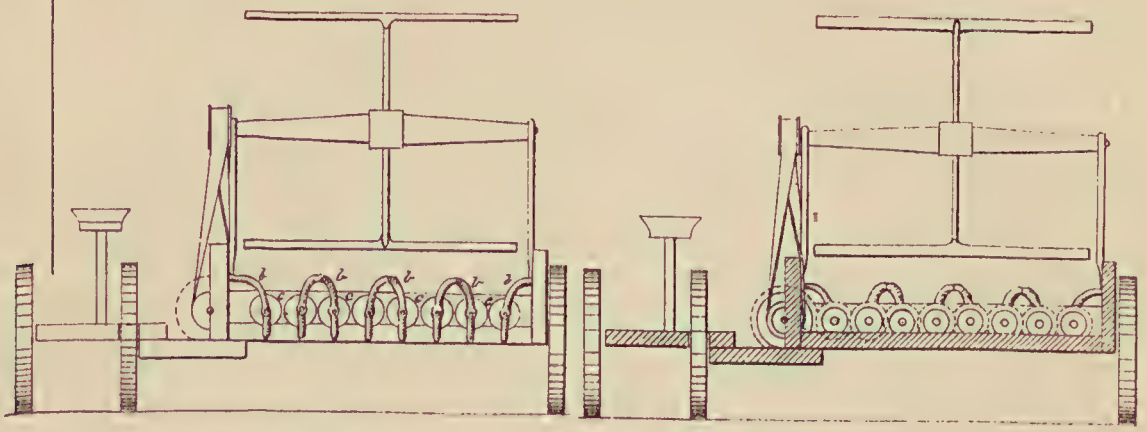
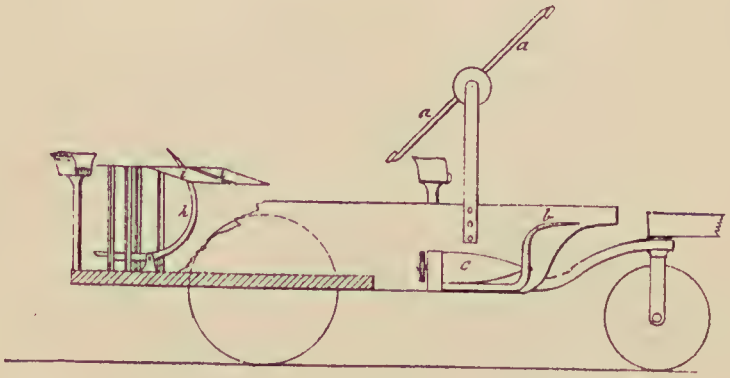
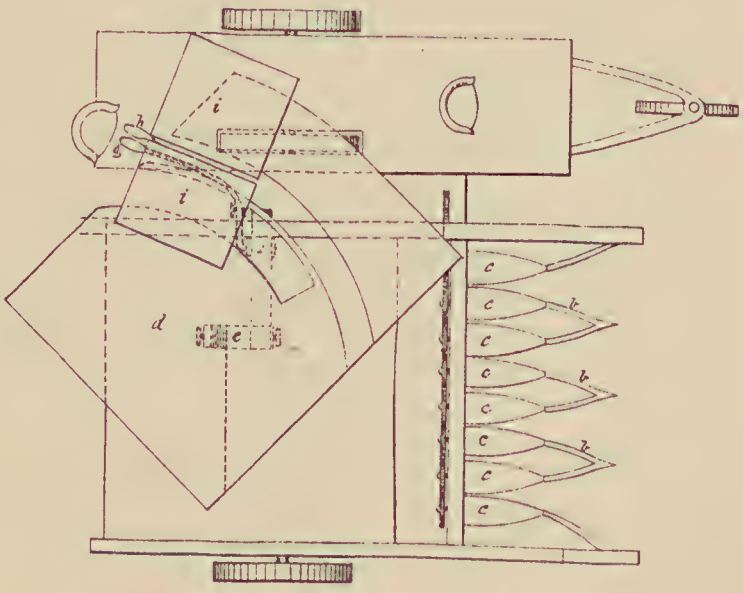
PLATE IV.







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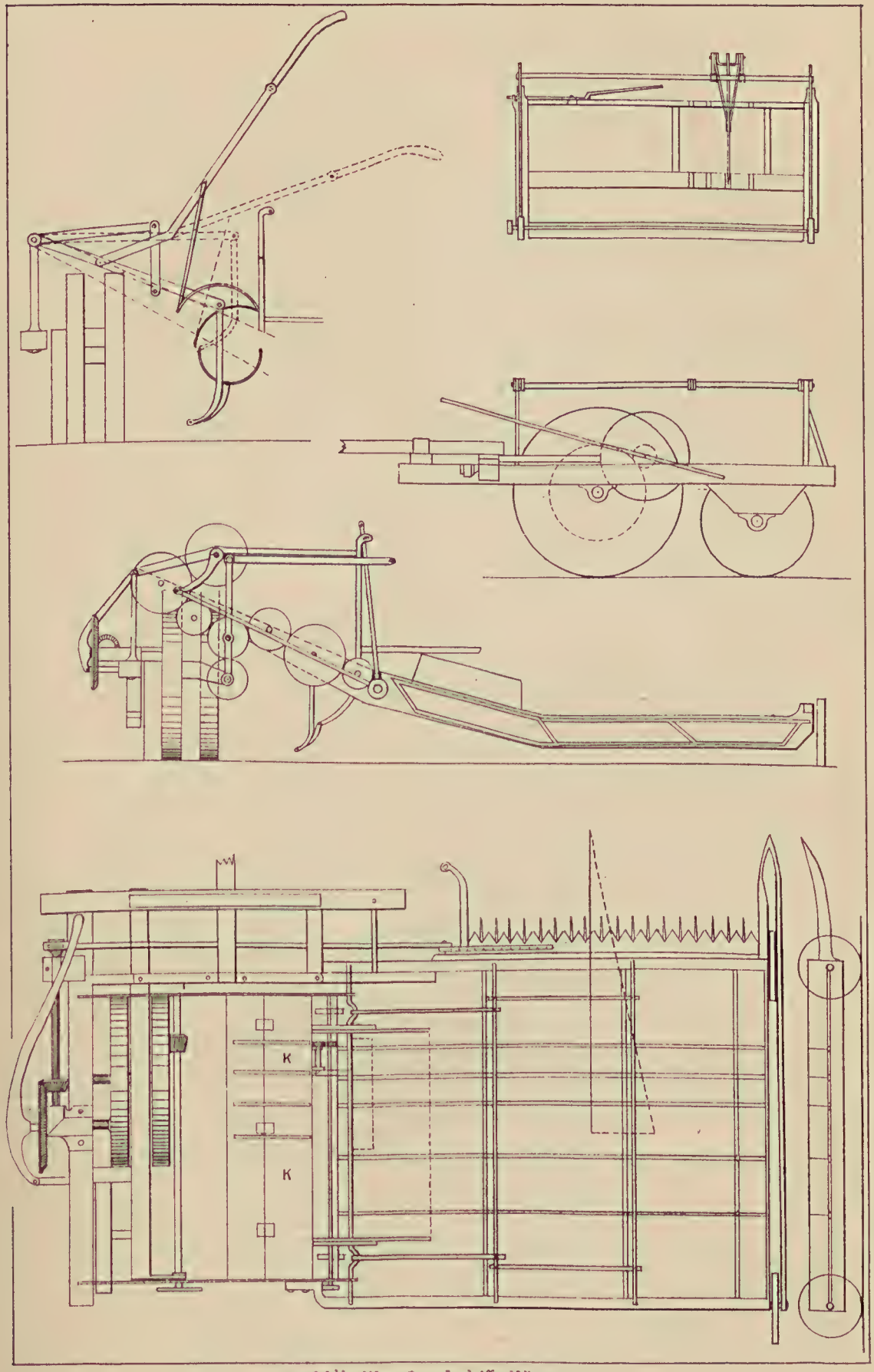

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PLATE VI

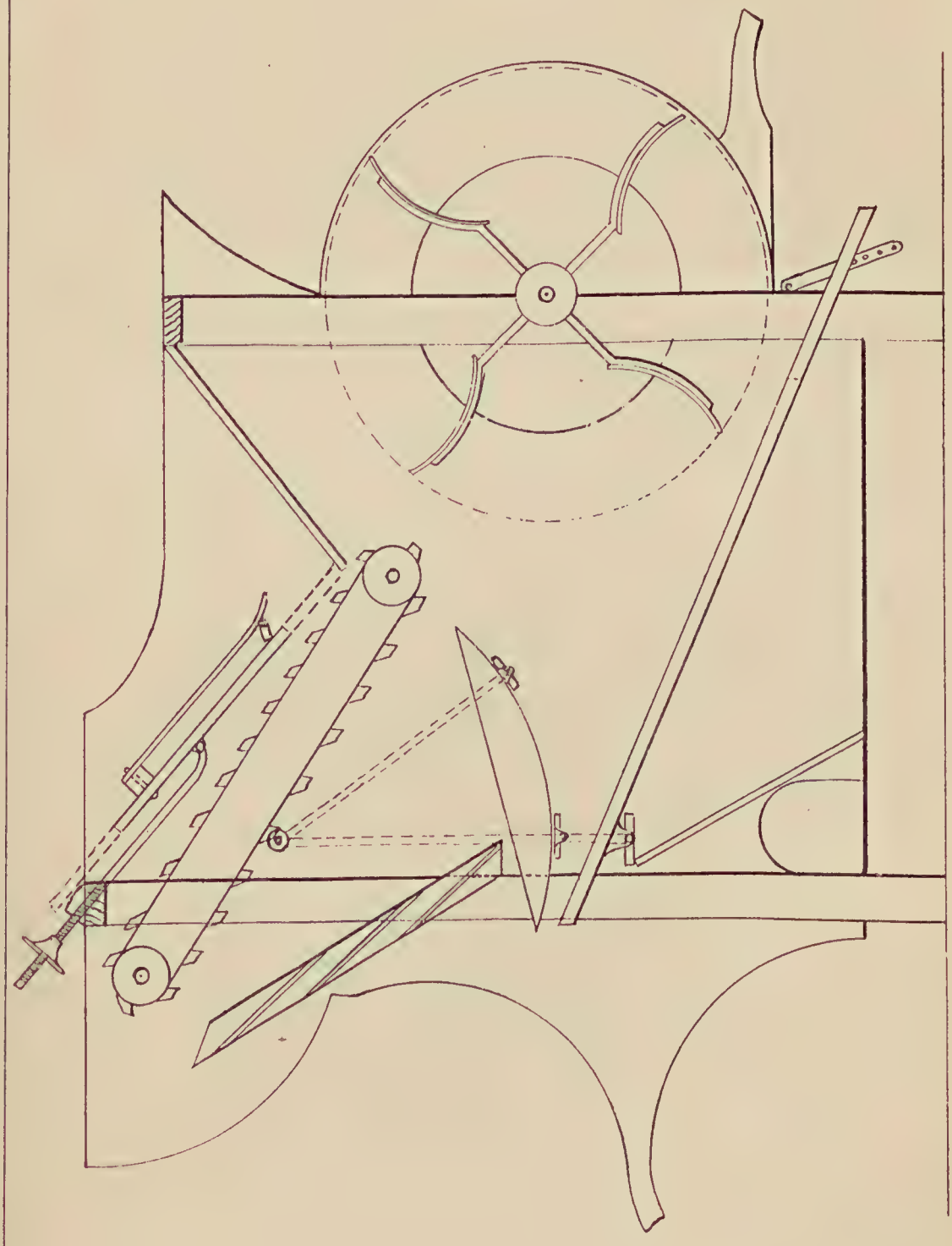

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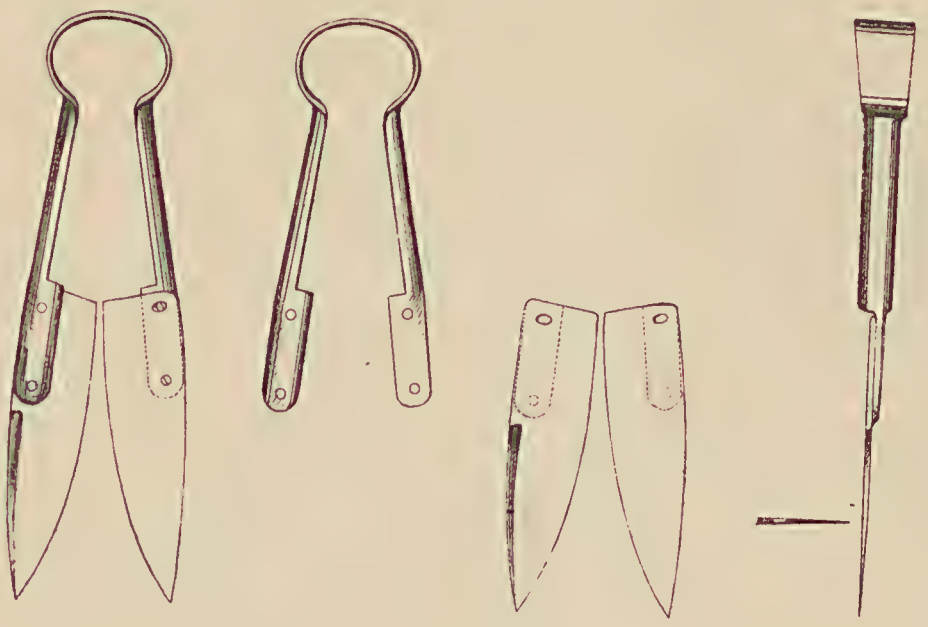
PLATE VII



G G McCrae del.

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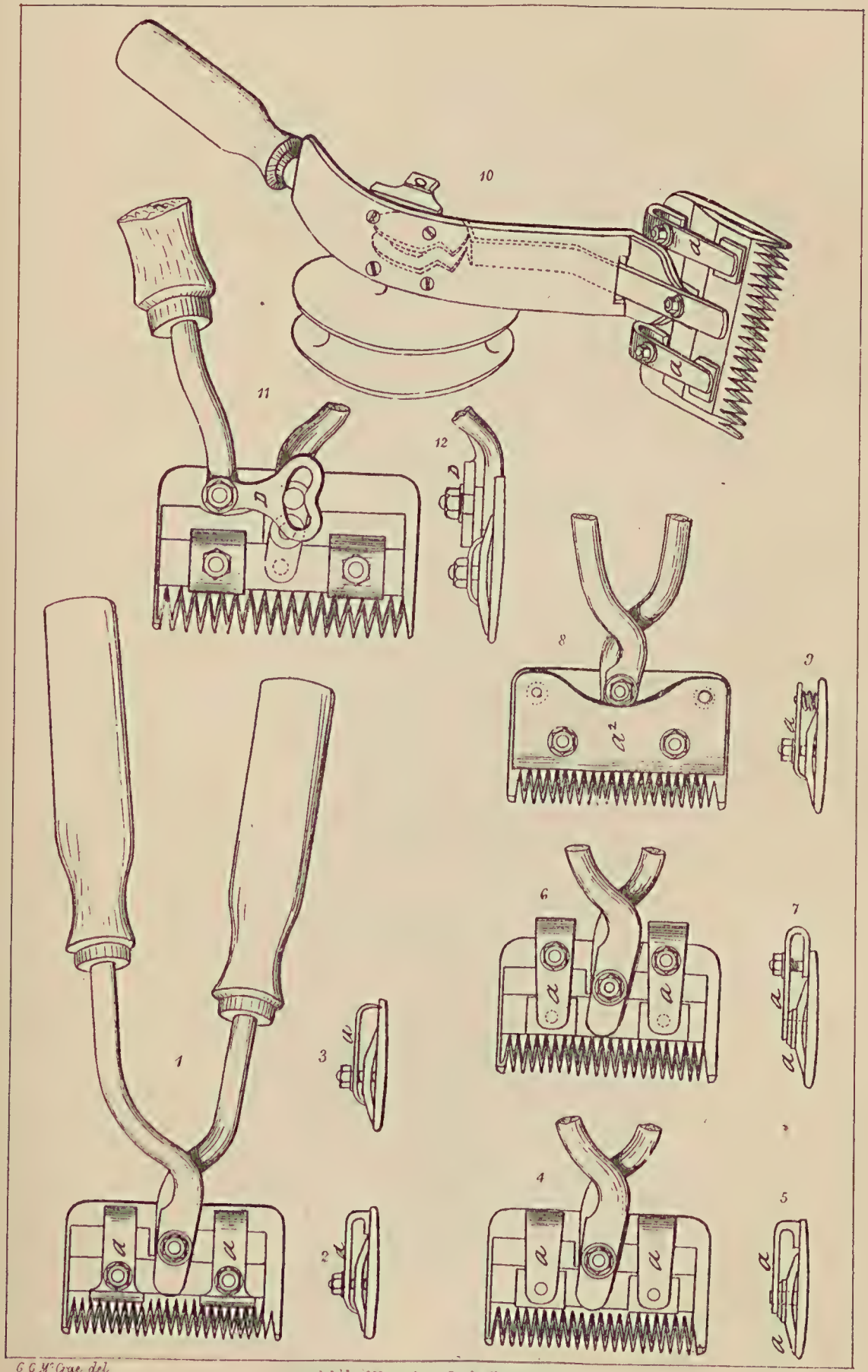
PLATE VIII.



G C Mc Crae del.

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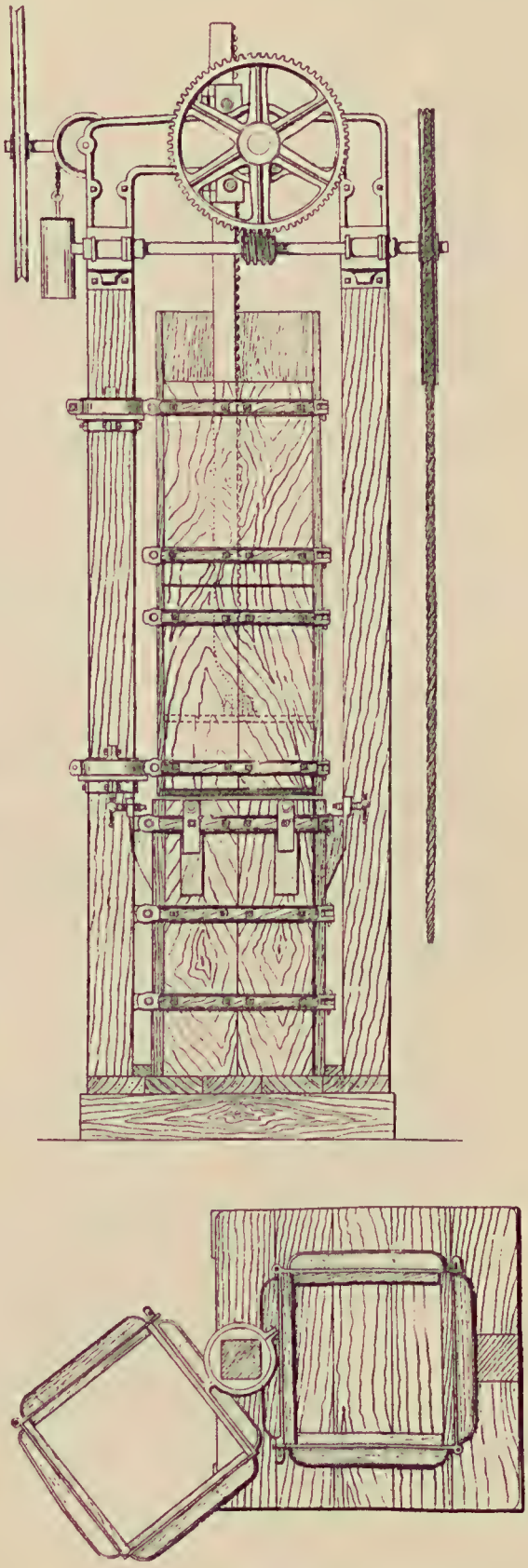
PLATE IX.



C.C.McCrae del.

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PLATE X.

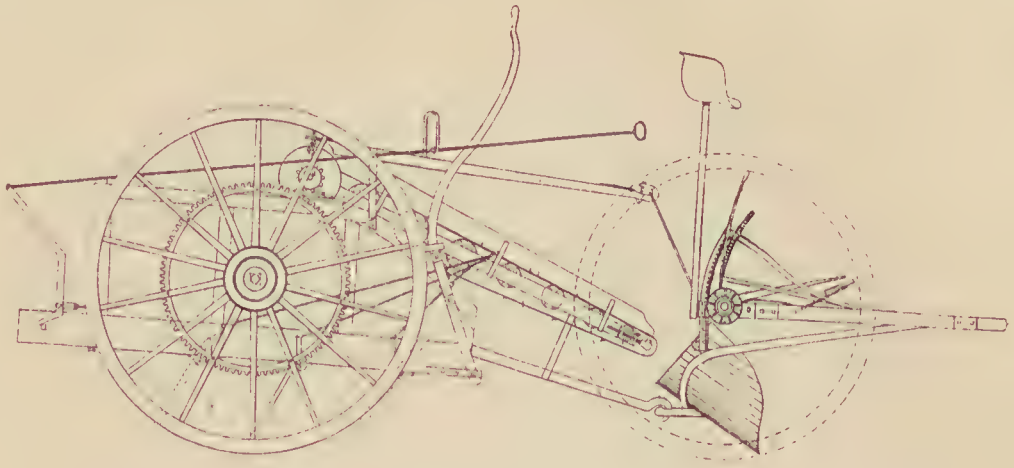


Fig. 1
SIDE ELEVATION

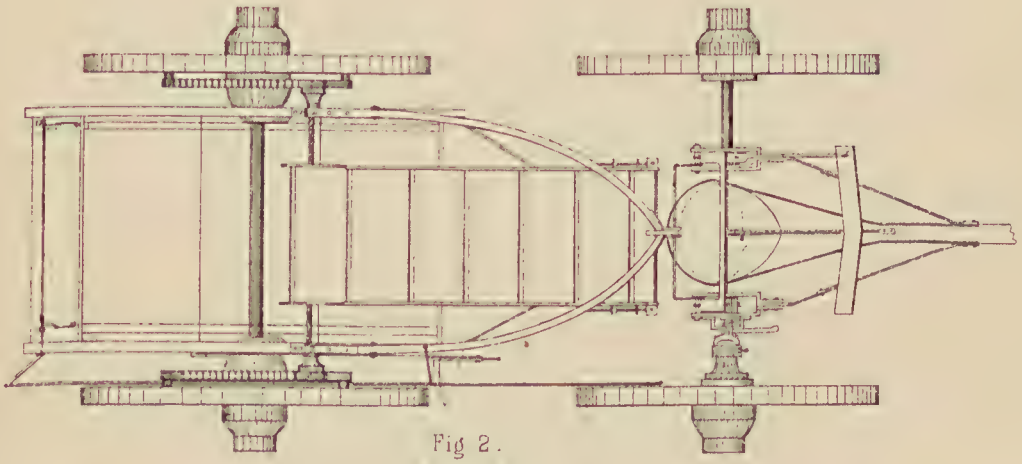
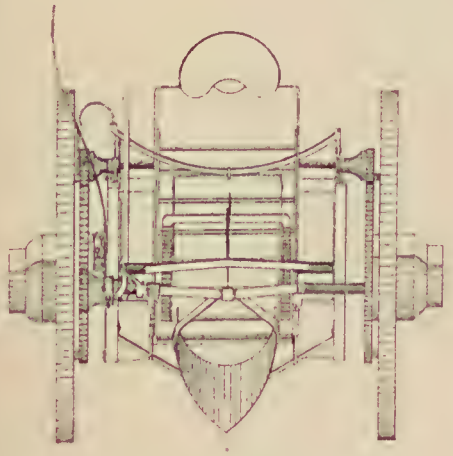


Fig 2.
PLAN



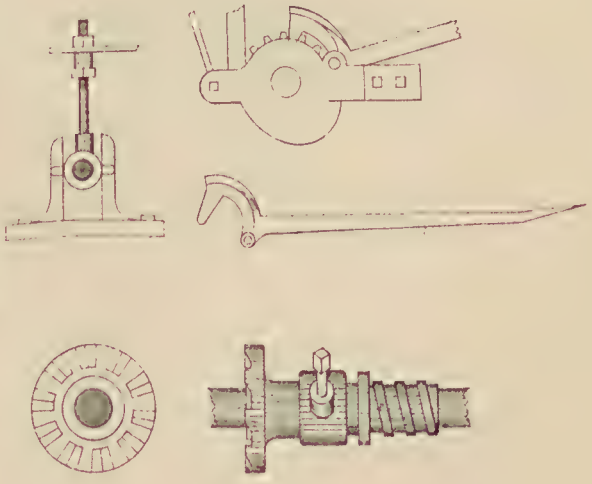


Fig. 3
FRONT ELEVATION

Photo-lith.d by J Noone Crown Lands Office, Melbourne

REPORT OF THE METEOROLOGY OF VICTORIA FOR 1874.

SUPPLIED BY THE DEPARTMENT OF THE GOVERNMENT ASTRONOMER.

YEARLY AVERAGE TABLE.

AVERAGES AND EXTREMES FOR THE FOUR SEASONS AND FOR THE YEAR OF DIFFERENT METEOROLOGICAL ELEMENTS AT MELBOURNE OBSERVATORY. (91 FEET ABOVE SEA-LEVEL.)

Mean of Barometer for Spring (Sept.–Nov.) ..	29·887 inches.	Mean monthly range,	0·812 inch.
„ Summer (Dec.–Feb.) ..	29·835 „	„	0·810 „
„ Autumn (Mar.–May) ..	30·004 „	„	0·983 „
„ Winter (June–Aug.) ..	30·002 „	„	0·932 „
„ Year	29·932 „	„	0·884 „
Greatest Monthly range	1·503 „	in August 1870.	
Smallest „	0·525 „	in March 1870.	
Greatest Yearly range	1·719 „	in 1863.	
Smallest „	1·218 „	in 1860.	
Greatest range during 14 years	1·810 „		

Mean Temperature of Air for Spring	57°·0.	Mean Monthly range,	46°·4.
„ „ Summer	65°·3.	„	54°·5.
„ „ Autumn	58°·7.	„	43°·0.
„ „ Winter	49°·2.	„	32°·3.
„ „ Year	57°·6.	„	44°·1.
Greatest Monthly range	69°·1, in December 1868.		
Smallest „	22°·9, in August 1861.		
Greatest Yearly range	82°·6, in 1868.		
Greatest range during 14 years	84°·2.		
Mean Daily range for Spring	19°·8.		
„ Summer	22°·1.		
„ Autumn	18°·6.		
„ Winter	14°·8.		
„ Year	18°·8.		
Greatest Mean daily range in 14 years	27°·2, in November 1862.		
Smallest „ „ „	7°·7, in June 1860.		
Highest Temperature in the Shade	111°·2, on 14th Jan. 1862, and 111°·0, 22nd Jan. 1860.		
Lowest „ „	27°·0, on 21st July 1869, and 27°·4, 11th July 1868.		
Highest Solar Radiation	160°·0, on 14th January 1862.		
Lowest Terrestrial Radiation	22°·0, on 21st July 1869.		
Mean Temperature of Surface-soil for Spring ..	62°·0. Summer, 76°·5.	Year, 62°·4.	During 14 years.
„ „ Autumn ..	61°·9. Winter, 49°·2.		
„ of Bulb 14 in. deep for Spring ..	53°·9. Summer, 65°·2.	Year, 56°·0.	Average for 12 „
„ „ Autumn ..	58°·2. Winter, 46°·6.		
„ of Bulb 3 feet deep for Spring ..	57°·3. Summer, 67°·6.	Year, 60°·0.	Average for 11 „
„ „ Autumn ..	63°·5. Winter, 51°·5.		
„ of Bulb 6 feet deep for Spring ..	57°·3. Summer, 66°·3.	Year, 60°·9.	Average for 11 „
„ „ Autumn ..	65°·0. Winter, 55°·0.		
„ of Bulb 8 feet deep for Spring ..	56°·6. Summer, 63°·7.	Year, 60°·4.	Average for 11 „
„ „ Autumn ..	64°·5. Winter, 56°·6.		
„ of Dew-point for Spring ..	46°·4. Summer, 52°·2.	Year, 47°·6.	Average for 13 „
„ „ Autumn ..	49°·1. Winter, 42 6°.		

Mean Humidity for Spring, 70 per cent. Summer, 65 per cent.	Year, 72 per cent.	Average for 14 years.
„ Autumn, 73 „ Winter, 79 „		
Mean Rainfall for Spring, 7·79 in. in 40·3 days. Summer, 6·41 in. in 24·4 days.		Average for 14 years.
„ Autumn, 5·78 in. in 28·9 days. Winter, 5·67 in. in 41·9 days.		
„ Year, 25·65 in. in 135·5 days.		
Greatest Yearly Rainfall, 44·25 in. in 1849.	Since 1840.	
Smallest „ 15·94 in. in 1865.		

WIND:—

Mean number of Miles for the Year, 7838. Mean hourly velocity, 10·7 miles. } Average of 6 years.

Greatest hourly velocity, 58 miles, from midnight to 1 a.m. on 8th March 1866, from West.

Percentage of hours during which the Wind blew from different points of the compass. (Average of 6 years.)

	N.	N.W.	W.	S.W.	S.	S.E.	E.	N.E.	CALMS.
Spring ..	16·2	8·6	15·9	17·0	16·1	8·9	4·3	12·0	1·0
Summer ..	7·4	4·0	8·6	19·3	24·9	20·2	6·2	8·5	0·9
Autumn ..	14·4	6·2	10·4	13·3	16·0	16·7	6·7	14·9	1·4
Winter ..	31·8	13·5	13·9	8·7	5·3	4·8	3·3	17·7	1·0
Year	17·5	8·1	12·2	14·5	15·6	12·6	5·1	13·3	1·1

During 14 years.

METEOROLOGICAL

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9$^{h.}$ 39$^{m.}$ 54·8$^{s.}$ E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
					In Shade.		Radiation.		
	Mean.	Air.	Surface Soil.	Dew-point.	Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	30·052	65·0	77·7	54·3	76·0	50·0	120·2	44·0	0·68
2	29·959	74·1	83·0	55 7	99 9	52·8	133·8	46·8	0·53
3	29·878	73·2	78·1	56·6	88·4	59·4	119·4	53·9	0·56
4	29·814	69·0	75·0	56·5	95·3	53·4	133·1	48·4	0·65
5	29·832	62·5	66·4	52·7	71·7	57·4	114·3	49·6	0·70
6	29·854	61·7	69·9	52·0	70·4	55·3	120·0	52·5	0·70
7	29·874	63·3	71·0	55·1	71·3	59·4	120·4	56·9	0·75
8	29·984	62·2	72·2	49·1	71·1	56·2	115·8	53·0	0·62
9	29·940	60·5	73·4	50·8	70·6	51·2	114·1	46·1	0·70
10	29·853	67·5	79·2	53·3	86·0	53·3	127·8	49·1	0·61
11	29·836	74·0	81·4	60·1	94·0	63·2	133·5	60·9	0·98
12	29·721	68·5	71·4	63·0	75·0	64·2	104·0	63·6	0·83
13	29·756	68·9	71·4	60·5	82·1	66·0	113·6	65·2	0·75
14	29·894	70·4	72·1	56·5	83·1	58·0	124·9	55·0	0·61
15	29·796	74·5	79·9	58·8	90·2	57·2	132·3	52·3	0·58
16	29·654	73·7	84·9	64·6	90·8	64·9	124·1	62·3	0·73
17	29·478	66·8	70·7	59·3	74·0	60·5	109·2	58·0	0·77
18	29·882	60·5	64·3	48·6	71·1	50·2	119·7	48·4	0·65
19	29·985	62·6	69·9	51·6	71·0	58·2	116·8	56·0	0·67
20	29·803	75·9	82·8	57·1	93·8	52·8	136·0	47·6	0·52
21	29·900	64·8	73·3	55·4	73·3	59·0	120·0	56·0	0·72
22	29·887	63·0	81·3	52·2	74·2	49·8	117·3	43·0	0·68
23	30·023	60·3	75·6	47·5	69·1	56·0	115·0	56·9	0·63
24	29·866	61·0	78·3	51·8	71·0	54·2	114·8	49·8	0·72
25	29·719	61·9	79·4	52·8	72·0	53·1	121·0	48·0	0·72
26	30·033	58·7	76·5	42·2	68·7	54·1	116·3	..	0·54
27	30·174	62·1	79·6	50·5	70·2	54·1	118·0	51·1	0·66
28	30·077	64·0	82·2	51·7	72·1	54·6	120·4	52·0	0·64
29	29·967	62·9	82·2	53·0	70·6	57·0	120·0	56·0	0·70
30	29·865	64·3	84·1	51·4	79·8	56·6	121·2	54·0	0·63
31	30·054	59·6	76·5	44·1	67·4	55·0	117·0	48·0	0·56
Means & Sums	29·884	65·7	76·2	53·8	77·9	56·4	120·5	52·8	0·67

GENERAL ABSTRACT:

Barometer :—

Maximum, 30·229 inches, on the 27th.
Minimum, 29·373 inches, on the 17th.
Range in the month, 0·856 inches.
Mean for the month, 29·884 inches, being 0·054 inches higher than the average for the preceding sixteen years.

Temperature of Air :—

Highest in the shade, 99·9°, on the 2nd.
Lowest in the shade, 49·8°, on the 22nd.
Range in the month, 50·1°.
Greatest daily range, 47·1°, on the 2nd.
Least daily range, 10·8°, on the 12th.
Mean daily range, 21·5°.
Mean for the month, 65·7°, being 1·0° lower than the average for the preceding sixteen years.

Temperature of Soil :—

On Surface—Mean, 76·2°, being 1·1° lower than the average for the preceding fifteen years.
Bulb 14 inches deep—Maximum, 53·8°; minimum, 48·0°; range in the month, 5·8°; mean, 50·3°.

OBSERVATIONS.

Observatory for the Month ending 31st January 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	S. and S.W. ..	0	Very fine and pleasant; heavy dew in evening.
2	W. and S.W...	0	Fine, but very hot and sultry, with thick haze and smoke from bushfires.
3	S.	0	Hot, sultry, and very hazy in a.m.; fine and pleasant in p.m.; evening sultry.
4	S.W. and N.E.	0	Heavy dew; fine, but dull and hazy; violent dust storm, with backing of the wind from N.E, round E., to S.S.W., shortly before 6 p.m.
5	S.	0·024	Dull and boisterous, with distant thunder and light rain in a.m.; fine and cool in p.m.
6	S.	0	Fine and pleasant, but dull.
7	S.	0	Fine and cool, but dull, with strong gusts of wind occasionally.
8	S. and S.E. ..	0	Fine and pleasant, with cool, fresh wind.
9	S.E. and S.W.	0	Fine and pleasant, with cool, fresh breeze.
10	S.E.	0	Fine and pleasant in a.m.; rather hot in p.m.; sheet lightning in S. at 10 p.m.
11	E. and S.E. ..	0·337	Dull and sultry: thunder and lightning after 4 p.m., with rain showers through the evening.
12	E. and N.E. ..	0·930	Dull, sultry, and showery.
13	S.	0·068	Dull, close, and sultry in a.m.; cool and pleasant in p.m.
14	S.E.	0	Very fine and clear, but rather hot.
15	S.W. and S. ..	0	Very heavy dew; beautiful, clear day, but hot.
16	S.W. and W...	0	Fine, but very hazy and sultry.
17	S.W.	0·747	Dull and sultry in a.m.; boisterous and squally, with heavy rain showers, in p.m.
18	S. and W. ..	0	Very fine, cool, and pleasant.
19	S.W.	0	Delightful day.
20	N.	0	Fine and clear in a.m.; hot and sultry in p.m.; vivid lightning in W. and S. during evening.
21	S.	0·030	Light showers during night; very fine, cool, and pleasant all day.
22	S.	0	Heavy dew; very fine, with cool, gentle breeze.
23	S.	0	Very fine and pleasant, with cool, fresh breeze.
24	S. and S.E. ..	0	Very fine and pleasant, with cool, gentle breeze.
25	S.	0	Fine and pleasant in a.m.; boisterous and squally in p.m.
26	S.	0·005	Fine and pleasant, with cool, fresh breeze.
27	S.E. and S.W.	0	Dull in a.m.; very fine and clear in p.m.
28	S. and S.E. ..	0	Fine and pleasant, but dull.
29	S.E. and S. ..	0	Dull in a.m.; very fine and pleasant in p.m.
30	S.	0	Beautiful clear day, with cool, fresh breeze; evening dull and gloomy.
31	S. and S.W. ..	0	Fine and pleasant; but rather boisterous.
..	..	2·141	

Temperature of Soil—*continued.* JANUARY 1874.

Bulb 3 feet deep—Maximum, 70·0°; minimum, 67·2°; range in the month, 2·8°; mean, 68·8°, being 0·4° higher than the average for the preceding twelve years.

Bulb 6 feet deep—Maximum, 68·4°; minimum, 66·3°; range in the month, 2·1°; mean, 67·4°, being 0·6° higher than the average for the preceding twelve years.

Bulb 8 feet deep—Maximum, 65·6°; minimum, 63·4°; range in the month, 2·2°; mean, 64·5°, being 0·5° higher than the average for the preceding twelve years.

Solar Radiation:—

Maximum, 136·0°, on the 20th.

Terrestrial Radiation:—

Minimum, 43·0°, on the 22nd.

Humidity of Air:—

Mean, 67 (that of Saturation being represented by 100), being 2 higher than the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 53·8°, being 0·4° higher than the average for the preceding fifteen years.

Rain fell on six days, to the amount of 2·14 inches, being 0·05 inches more than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
		Air.	Surface Soil.	Dew-point.	In Shade.		Radiation.		
	Mean.				Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	30·054	60·4	78·7	44·6	70·0	55·0	112·2	..	0·56
2	29·857	61·3	78·2	47·0	75·7	47·0	120·2	40·9	0·59
3	29·914	59·2	79·2	47·7	69·7	50·0	112·6	46·8	0·66
4	29·610	69·6	74·2	52·4	92·1	52·1	120·2	47·0	0·54
5	29·734	63·4	79·5	49·0	77·1	55·9	118·8	53·6	0·60
6	29·728	69·1	84·1	51·5	88·0	51·0	125·1	45·1	0·54
7	29·665	68·5	80·4	54·6	85·0	54·2	132·0	49·0	0·61
8	29·834	61·6	82·3	50·6	75·5	58·6	120·0	56·2	0·67
9	29·937	59·6	73·5	43·8	69·7	51·7	120·2	48·8	0·56
10	29·916	61·6	77·5	50·5	73·4	44·4	119·8	38·4	0·67
11	29·965	71·2	80·5	56·4	87·1	56·8	130·6	53·2	0·60
12	29·943	70·5	83·9	54·3	87·9	55·0	126·1	50·0	0·57
13	29·839	71·9	84·7	52·5	88·2	56·3	128·2	48·1	0·51
14	29·714	81·7	91·0	57·1	101·0	60·0	134·0	55·9	0·43
15	29·700	71·1	73·2	57·9	76·0	60·5	119·0	60·0	0·63
16	30·013	58·6	62·5	45·6	65·0	52·6	115·4	52·8	0·62
17	30·022	56·8	58·8	47·0	62·4	50·1	90·0	43·3	0·70
18	30·033	57·8	64·3	48·0	67·2	49·6	118·2	47·2	0·70
19	30·024	60·0	68·2	50·7	67·9	53·3	120·0	43·6	0·71
20	30 009	61·8	73·1	48·9	72·5	51·8	118·9	48·2	0·63
21	30·021	62·0	70·4	47·6	75·5	51·4	120·0	48·3	0·59
22	29·981	64·0	76·7	49·6	79·4	46·0	119·0	41·1	0·60
23	29 933	66·2	75·7	56·2	80·6	54·3	120·9	48·8	0·70
24	30·093	62·5	66·4	52·7	69·6	58·0	106·0	55·7	0·70
25	30·190	59·9	70·6	50·1	69·4	54·1	118·7	..	0·70
26	30·132	61·3	74·4	50·5	74·4	49·4	116·0	44·6	0·68
27	29·874	72·7	80·1	49·4	88·8	52·9	122·0	48·1	0·44
28	29·747	65·0	67·8	46·1	72·8	56·5	114·0	50·1	0·51
Means & Sums	29·910	64·6	75·4	50·4	77·2	53·2	119·2	48·6	0·61

GENERAL ABSTRACT:

BAROMETER:—

Maximum, 30·221 inches, on the 25th.
Minimum, 29·519 inches, on the 4th.
Range in the month, 0·702 inches.
Mean for the month, 29·910 inches, being 0·031 inches higher than the average for the preceding sixteen years.

TEMPERATURE OF AIR:—

Highest in the shade, 101·0°, on the 14th.
Lowest in the shade, 44·4°, on the 10th.
Range in the month, 56·6°.
Greatest daily range, 41·0°, on the 14th.
Smallest daily range, 11·6°, on the 24th.
Mean daily range, 24·0°.
Mean for the month, 64·6°, being 1·0° lower than the average for the preceding sixteen years.

TEMPERATURE OF SOIL:—

On Surface—Mean, 75·4°, being 0·3° higher than the average for the preceding fifteen years.
Bulb 14 inches deep—Maximum, 54·8°; minimum, 46·0°; range in the month, 8·8°; mean, 49·9°.
Bulb 3 feet deep—Maximum, 71·9°; minimum, 68·7°; range in the month, 3·2°; mean, 70·0°, being 0·9° higher than the average for the preceding twelve years.

Observatory for the Month ending 28th February 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. — Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	S.E. and S. ..	0	Very fine and pleasant; fine, clear evening.
2	S. and S.E. ..	0	Heavy dew; fine, cool, and pleasant.
3	S.E.	0	Delightful, cool weather; fine and clear evening.
4	N. and N.E. ..	0·004	Hot wind and clouds of dust; shifted to S.S.W. at 3 p.m.; blowing fresh and cool; sheet lightning all evening, with distant thunder and scattered rain.
5	S. and S.W. ..	0·022	Very fine and pleasant.
6	S.E. and S. ..	0	Fine and pleasant; hot in p.m.
7	S. and S.E. ..	0	Heavy dew; fine and rather hot; evening clear.
8	S.	0	Dull and sultry in a.m.; fine and cool in p.m.; showery at 11 p.m.
9	S. and S.E. ..	0	Fine and cool.
10	S.W.	0	Thick haze in a.m.; fine and cool in p.m.; evening clear.
11	S.E.	0	Heavy dew; hot, boisterous, and dusty.
12	S.E.	0	Heavy dew; fine, clear, and hot all day.
13	N.E. and S. ..	0	Heavy dew; very fine and clear, but hot.
14	N. and N.E. ..	0	Fine and clear, but very hot.
15	S.	0·408	Wind round from N. to S. at 7 a.m.; thunder and lightning, with rain, at 2 p.m.; showery in evening.
16	S. and S.W. ..	0·152	Fine and cool, but rather boisterous.
17	S.	0·147	Fine and pleasant in a.m.; dull, cold, and showery in p.m.
18	S.	0	Fine and cool, but rather boisterous.
19	S. and S.E. ..	0	Dull, heavy sky in a.m.; fine, but boisterous in p.m.
20	S.E.	0	Fine, but dull, and rather boisterous; evening fine and clear.
21	S.E.	0	Heavy dew; fine and pleasant; evening clear.
22	S.E.	0	Heavy dew; very fine, clear, and pleasant all day.
23	S.E. and S.W.	0	Heavy dew; thick haze in a.m.; very fine, cool, and clear in p.m.
24	S.	0	Dull and boisterous all day.
25	S.	0	Fine and pleasant, but cloudy.
26	S.W. and S.E.	0	Heavy dew; beautiful, clear day.
27	N.	0	Heavy dew; hot and boisterous, with clouds of dust.
28	S.W. and N. ..	0·150	Strong hot wind all night; very boisterous and showery all day.
	..	0·883	

FEBRUARY 1874.

Temperature of Soil—*continued.*

Bulb 6 feet deep—Maximum, 69·8°; minimum, 68·6°; range in the month, 1·2°; mean, 69·2°, being 0·9° higher than the average for the preceding twelve years.

Bulb 8 feet deep—Maximum, 67·0°; minimum, 65·9°; range in the month, 1·1°; mean, 66·6°, being 0·9° higher than the average for the preceding twelve years.

Solar Radiation:—

Maximum, 134·0°, on the 14th.

Terrestrial Radiation:—

Minimum, 38·4°, on the 10th.

Humidity of Air:—

Mean, 61 (that of Saturation being represented by 100), being 6 lower than the average for the preceding sixteen years, and the lowest on record during that period, with the exception of February 1865, when it was 58, and in 1866, when it was 61, the same as above.

Temperature of Dew-point:—

Mean, 50·4°, being 3·0° lower than the average for the preceding fifteen years, and the lowest on record during the period, with the exception of February 1865, when it only reached 48·9°.

Rain fell on five days, to the amount of 0·88 inches, being 1·08 inches less than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9$^{h.}$ 39$^{m.}$ 54·8$^{s.}$ E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
					In Shade.		Radiation.		
	Mean.	Air.	Surface Soil.	Dew-point.	Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	30·105	57·6	68·5	44·6	68·0	47·0	111·6	39·0	0·62
2	30·154	59·7	70·7	48·1	69·3	49·2	113·7	44·1	0·66
3	30·144	61·1	69·5	50·5	70·9	57·4	119·5	..	0·68
4	30·009	60·0	64·9	55·6	64·2	54·1	74·9	..	0·85
5	29·811	64·3	68·9	59·9	71·7	58·0	118·0	54·6	0·86
6	29·871	62·6	65·3	57·6	69·3	60·3	107·3	59·0	0·84
7	30·018	62·4	64·3	53·6	76·0	56·3	120·0	54·5	0·73
8	30·057	66·1	71·0	50·3	81·0	52·0	120·5	48·0	0·57
9	30·004	68·2	69·0	54·1	79·8	55·4	108·0	50·1	0·61
10	29·899	70·9	72·9	60·5	83·3	62·1	120·8	60·3	0·70
11	29·768	74·4	74·6	61·5	92·4	61·2	132·3	57·1	0·64
12	29·753	65·3	72·1	58·6	77·0	60·0	119·9	57·0	0·79
13	29·654	62·5	66·5	57·1	69·2	55·1	94·0	51·1	0·82
14	29·588	59·0	61·8	56·6	63·0	56·0	72·0	54·0	0·92
15	29·973	57·0	63·4	49·3	66·0	51·6	108·1	50·0	0·76
16	30·112	57·7	62·5	51·1	67·1	50·1	115·6	46·4	0·79
17	29·943	59·7	64·9	49·9	73·0	47·6	121·5	43·7	0·70
18	29·919	60·1	61·6	46·7	71·6	53·8	120·1	51·1	0·61
19	29·956	62·2	64·8	52·2	73·5	51·5	121·3	44·8	0·70
20	29·797	65·2	64·3	48·7	79·8	50·5	125·4	45·3	0·55
21	29·790	65·5	65·7	59·4	79·0	63·1	99·0	59·6	0·81
22	29·836	58·1	60·1	56·0	61·2	56·5	94·0	56·0	0·93
23	29·975	57·8	58·9	50·2	63·2	52·9	108·2	51·6	0·76
24	30·201	56·3	57·8	44·3	65·1	47·0	118·2	42·4	0·64
25	30·225	60·5	61·5	52·2	73·7	48·3	123·9	44·0	0·74
26	30·025	67·4	66·8	57·7	82·1	58·1	120·1	50·3	0·71
27	29·888	65·2	66·1	57·4	71·6	59·0	84·3	59·0	0·76
28	29·979	59·2	62·4	54·1	61·3	56·0	90·3	55·8	0·83
29	30·095	62·5	65·1	58·7	70·0	57·0	111·3	56·9	0·87
30	30·280	62·2	62·2	54·7	69·4	58·7	121·3	57·2	0·76
31	30·101	63·1	65·2	60·0	66·3	57·9	..	56·0	0·90
Means & Sums	29·965	62·4	65·6	53·9	71·9	55·0	110·5	51·7	0·75

General Abstract:

Barometer:—
Maximum, 30·315 inches, on the 30th.
Minimum, 29·525 inches, on the 14th.
Range in the month, 0·790 inches.
Mean for the month, 29·965 inches, being 0·009 inches lower than the average for the preceding sixteen years.

Temperature of Air:—
Highest in the shade, 92·4°, on the 11th.
Lowest in the shade, 47·0°, on the 1st and 24th.
Range in the month, 45·4°.
Greatest daily range, 31·2°, on the 11th.
Least daily range, 4·7°, on the 22nd.
Mean daily range, 16·9°.
Mean for the month, 62·4°, being 1·4° lower than the average for the preceding sixteen years.

Temperature of Soil:—
On Surface—Mean, 65·6°, being 4·7° lower than the average for the preceding fifteen years, and the lowest on record during that period.
Bulb 14 inches deep—Maximum, 48·7°; minimum, 40·9°; range in the month, 7·8°; mean, 44·9°.

Observatory for the Month ending 31st March 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. — Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	S. and S.E. ..	0	Heavy dew; very fine and pleasant.
2	S.E.	0	Very fine, cool, and pleasant.
3	S.E. and S. ..	0	Fine, cool, and pleasant.
4	S.	0·642	Dull and gloomy; light steady rain in p.m.; heavy showers in evening.
5	S.E. and S. ..	0·187	Dull and sultry, with misty rain showers.
6	S.	0·237	Thunder and lightning in night; dull and showery in a.m.; fine in p.m.
7	S.E.	0	Very fine and pleasant; Aurora Australis visible in evening.
8	E.	0	Heavy dew; very fine and pleasant; Aurora Australis visible in evening.
9	N. and N.E. ..	0	Heavy dew; dull and sultry all day.
10	N.E. and N. ..	0·139	Showery in early morning; fine, but hot and sultry, all day.
11	N.E.	0·097	Very hot and sulty; lightning and distant thunder at 3 p.m.; light rain showers in evening, with lightning in N.W. and S.E.
12	S.W.	0·033	Dull in a.m.; fine and pleasant in p.m.
13	S.E.	0·013	Heavy dew; fine, but dull; drizzling rain in evening.
14	S. and S.E. ..	0·959	Dull and sultry with drizzling rain in a.m.; thunder and lightning and heavy showers in p.m.
15	S. and W. ..	0·036	Fine, cool, and pleasant.
16	W.	0·011	Dull, misty, and foggy in a.m.; fine in p.m.
17	S. and N.E. ..	0	Very heavy dew; fine and pleasant all day; heavy rain shower at 10 p.m.
18	W.	0·151	Fine and pleasant.
19	N.W.	0	Fine and pleasant, and very mild.
20	N.E. and N. ..	0	Heavy dew; fine and pleasant in a.m.; dull and sultry in p.m.
21	S.	0·040	Dull and sultry with distant thunder in afternoon, and sheet lightning in N.E. and S.W. in evening.
22	W.	0·606	Steady, gentle rain all day.
23	W. and S.W. ..	0·210	Fine, with occasional light rain showers.
24	S. and S.E. ..	0·051	Light rain in night; fine, cool, and pleasant all day.
25	S.E.	0	Heavy dew; very fine and pleasant.
26	N.	0	Dull and sultry, and very hazy.
27	S. and N.E. ..	0·925	Dull, sultry, and showery; lightning in night; steady rain in evening.
28	S.	0·625	Steady rain all night; dull, showery, and misty.
29	W.	0·048	Dull, sultry, and misty.
30	S.E.	0·065	Fine, but boisterous; steady rain in evening.
31	E.	1·282	Dull and sultry, with steady rain.
..	..	6·357	

MARCH 1874.

Temperature of Soil—*continued.*

Bulb 3 feet deep—Maximum, 69·4°; minimum, 65·2°; range in the month, 4·2°; mean, 67·6°, being 0·3° lower than the average for the preceding twelve years.

Bulb 6 feet deep—Maximum, 69·0°; minimum, 66·9°; range in the month, 2·1°; mean, 68·2°, being 0·2° higher than the average for the preceding twelve years.

Bulb 8 feet deep—Maximum, 67·0°; minimum, 65·5°; range in the month, 1·5°; mean, 66·4°, being 0·2° higher than the average for the preceding twelve years.

Solar Radiation.—

Maximum, 132·3°, on the 11th.

Terrestrial Radiation:—

Minimum, 39·0°, on the 1st.

Humidity of Air:—

Mean, 75 (that of Saturation being represented by 100), being 8 higher than the average for the preceding sixteen years, and the highest on record during that period.

Temperature of Dew-point:—

Mean, 53·9°, being 2·0° higher than the average for the preceding fifteen years.

Rain fell on nineteen days, to the amount of 6·36 inches, being 4·82 inches more than the average rainfall for the preceding sixteen years, and the highest on record during that period; the next highest occurred in March 1863, viz., 3·84 inches.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
		Air.	Surface Soil.	Dew-point.	In Shade.		Radiation.		
	Mean.				Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	29·859	66·3	67·7	62·8	73·0	60·0	91·6	58·0	0·89
2	29·699	62·7	65·2	60·4	71·3	60·0	107·2	60·0	0·92
3	29·837	58·7	62·1	51·4	67·5	53·1	113·0	51·9	0·77
4	29·832	59·5	60·0	51·6	68·0	52·3	114·0	47·0	0·75
5	29·791	60·1	60·2	50·7	67·0	56·0	104·6	52·0	0·71
6	29·984	62·0	64·8	50·6	74·5	52·9	119·0	48·0	0·66
7	30·201	58·9	63·2	51·5	71·0	50·2	120·1	45·1	0·76
8	30·224	61·3	66·9	55·4	74·2	50·2	117·8	46·9	0·81
9	30·188	64·5	68·1	57·3	78·5	56·6	125·4	56·1	0·77
10	30·166	64·2	66·7	57·1	74·4	55·1	120·0	51·8	0·78
11	30·121	61·2	68·1	54·2	75·0	55·4	118·2	53·7	0·78
12	29·986	62·4	64·7	53·4	78·0	52·2	120·5	47·8	0·72
13	29·838	64·1	63·8	55·7	77·5	55·1	121·1	51·1	0·74
14	30·138	56·7	61·0	46·2	63·7	51·4	113·9	49·5	0·68
15	30·144	52·5	58·2	45·6	63·8	41·1	110·7	36·7	0·77
16	30 125	57·2	60·6	49·9	70·6	45·9	112·7	41·1	0·77
17	30·044	66·1	63·3	52·1	77·3	52·7	113·6	48·1	0·61
18	30·111	58·8	62·0	56 0	63·5	56·4	78·0	56·1	0 91
19	30·102	54·9	59·5	49·1	64·0	48·9	110·8	43·0	0·81
20	29·949	57·7	59·7	48·5	73 6	46·9	113·6	42·0	0·72
21	30·156	56·7	61·2	51·9	69·7	48·7	112·6	42·5	0·84
22	29·997	61·6	63·0	52·1	75·8	45·8	109·2	41·9	0·71
23	29·861	61·1	61·4	52·6	69·0	56·5	114·5	52·3	0·74
24	30·201	52·2	56·2	45 0	61·9	45·3	106·8	40·8	0·77
25	30·298	54·7	57·8	46·7	61·0	47·6	102·7	42·0	0·75
26	30·285	51·0	56·7	46·4	65·0	43·2	102·0	38·9	0·84
27	30·213	52·4	56·5	47·6	63·7	41·9	100·0	38·3	0·84
28	30·103	55·2	58·7	50·8	64·1	45·3	95·0	42·9	0·85
29	30·056	55·7	58·3	51·7	62·7	47·1	89·1	42·9	0·86
30	29·986	57·1	59·0	52·1	73·6	47·0	107·2	43·3	0·83
Means & Sums	30·050	58·9	61·8	51·9	69·8	50·7	109·5	47·0	0·78

GENERAL ABSTRACT:

Barometer:—

Maximum, 30·324 inches, on the 25th, and 30·323 inches on the 26th.
Minimum, 29·664 inches, on the 2nd.
Range in the month, 0·660 inches.
Mean for the month, 30·050 inches, being 0·029 inches higher than the average for the preceding sixteen years.

Temperature of Air:—

Highest in the shade, 78·5°, on the 9th, and 78·0°, on the 12th.
Lowest in the shade, 41·1°, on the 15th, and 41·9°, on the 27th.
Range in the month, 37·4°.
Greatest daily range, 30·0°, on the 22nd.
Smallest daily range, 7·1°, on the 18th.
Mean daily range, 19·1°.
Mean for the month, 58·9°, being 0·1° higher than the average for the preceding sixteen years.

Temperature of Soil:—

On Surface—Mean, 61·8°, being 0·3° higher than the average for the preceding sixteen years.
Bulb 14 inches deep—Maximum, 46·6° minimum, 37·2°; range in the month, 9·4°; mean, 40·9°.

Observatory for the Month ending 30th April 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. — Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	N.E.	0·489	Dull, sultry, and showery.
2	S. and S.W. ..	0·565	Dull, showery, and very close; distant thunder in N. in afternoon.
3	W.	0·100	Fine, but dull, in a.m.; a few rain squalls in p.m.
4	N.W.	0	Fine, but dull; rather boisterous in p.m.
5	W.	0·005	Fine, but squally; scattered drops of rain occasionally.
6	N.W. and W.	0	Very fine and pleasant all day; dull in evening.
7	W.	0	Heavy dew; beautiful, clear day.
8	S. and S.W. ..	0	Heavy dew; fog at nine a.m.; very fine and clear in p.m.; Aurora Australis at 7.40 p.m.
9	N.E. and N. ..	0	Dense fog at 6 a.m.; very fine, clear, and warm all day.
10	N.E.	0	Heavy dew; beautiful, clear day.
11	N.E.	0	Dense fog in early morning; very fine and clear afterwards.
12	N.E.	0	Heavy dew; beautiful, clear day.
13	N.E.	0	Heavy dew; steady rain in a.m.; dull and sultry in p.m., with thunder and lightning at 4 p.m.
14	S. and S.E. ..	0	Fine and cool, rather boisterous.
15	S. and S.E. ..	0	Heavy dew; beautiful, clear day.
16	N.E.	0	Heavy dew; beautiful, clear day.
17	N. and N.E. ..	0	Heavy dew; very fine and clear in a.m.; dull and threatening in p.m.
18	S. and S.E. ..	0·231	Dull and gloomy, with drizzling rain.
19	S.E. and S.W.	0	Heavy dew; beautiful, clear day.
20	N.E.	0	Very fine and pleasant.
21	S.	0	Fine and pleasant, but dull, in a.m.; very fine and clear in p.m.
22	N. and N.E. ..	0	Heavy dew; beautiful, clear day, and warm; lightning in W. at 10.30 p.m.
23	W. and N. ..	0·319	Dull, showery, and boisterous in a.m.; fine and pleasant in p.m.
24	W. and S. ..	0	Very fine and pleasant all day; dull in evening.
25	S.E. and E. ..	0	Fine and pleasant all day, but dull.
26	W.	0	Heavy dew; fog in early morning; fine and pleasant afterwards.
27	N.E.	0	Heavy dew; fog in early morning; delightful, clear day.
28	N.E.	0	Dense fog in a.m.; fine in p.m.
29	S.E.	0	Fine and pleasant, but dull.
30	N.E. and N. ..	0	Dense fog in early morning; fine and very warm in p.m.
..	..	1·709	

APRIL 1874.

Temperature of Soil—*continued.*

Bulb 3 feet deep—Maximum, 65·9°; minimum, 61·3°; range in the month, 4·6°; mean, 64·1°, being 0·1° higher than the average for the preceding thirteen years.

Bulb 6 feet deep—Maximum, 66·5°; minimum, 63·9°; range in the month, 2·6°; mean, 65·4°, being 0·2° lower than the average for the preceding thirteen years.

Bulb 8 feet deep—Maximum, 65·5°; minimum, 63·9°; range in the month, 1·6°; mean, 64·7°, being 0·2° lower than the average for the preceding thirteen years.

Solar Radiation:—
Maximum, 125·4°, on the 9th.

Terrestrial Radiation;—
Minimum, 36·7°, on the 15th.

Humidity of Air:—
Mean, 78 (that of Saturation being represented by 100), being 5 lower than the average for the preceding sixteen years.

Temperature of Dew-point:—
Mean, 51·9°, being 2·2° higher than the average for the preceding fifteen years.

Rain fell on six days, to the amount of 1·71 inches, being 0·40 inches less than the average rainfall for the previous sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
					In Shade.		Radiation.		
	Mean.	Air.	Surface Soil.	Dew-point.	Max.	Min.	Solar. Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	29·926	57·9	58·7	51·8	71·0	51·0	110·9	47·2	0·80
2	30·022	58·0	61·1	52·4	64·3	51·6	105·0	46·1	0.82
3	29·978	58·0	59·5	51·9	68·0	50·4	107·0	46·2	0·80
4	29·806	57·4	57·5	51·4	69·3	50·5	109·1	46·9	0·80
5	29·772	55·3	56·3	51·5	65·0	48·6	101·9	43·8	0·87
6	29·641	53·8	56·3	51·1	58·6	47·0	64·2	43·0	0·91
7	29·770	55·9	57·6	51·6	64·5	50·7	95·4	49·0	0·85
8	29·966	55·1	55·0	49·6	66·1	48·2	90·4	44·9	0·82
9	29·992	57·9	56·8	49·3	72·6	48·0	104·7	44·0	0·73
10	29·761	56·0	54·0	45·7	63·0	47·0	74·7	42·2	0·68
11	29·561	54·4	53·6	46·5	61·7	49·0	78·1	48·0	0·75
12	29·766	53·5	54·0	48·5	58·7	47·9	77·0	43·1	0·83
13	30·004	52·0	52·8	44·8	59·2	47·8	88·9	..	0·76
14	30·065	51·0	53·5	45·7	59·4	42·9	99·5	37·0	0·82
15	30·071	49·1	50·4	42·9	58·8	41·2	97·1	37·2	0·79
16	30·032	45·7	50·5	41·4	61·0	36·1	95·4	33·5	0·85
17	29·838	47·8	49·2	40·0	58·0	36·4	83·0	32·8	0·74
18	29·769	54·9	52 8	46·3	62·6	46·6	93·2	42·8	0·73
19	29·638	53·4	51·8	45·2	62·5	48·7	95·0	43·4	0·74
20	29·558	49·3	50·1	42·2	57·1	44·9	93·1	..	0·76
21	29·629	48·3	47·2	43·6	55·8	42·0	94·1	37·2	0·84
22	29·701	46·7	46·3	41·1	53·1	42·5	90·6	37·7	0.81
23	30·147	49·4	49·6	45·0	57·2	42·2	96·0	..	0·85
24	30·326	53·0	52·2	49·0	58·0	46·0	96·0	43·0	0·86
25	30·464	52·5	53·7	48·9	59·7	47·9	99·2	45·2	0·87
26	30·430	49·9	50·5	45·2	64·3	39·7	100·8	37·4	0·84
27	30·399	50·2	50·1	45·4	63·3	41·9	99·1	36·9	0·83
28	30·225	48·9	49·9	43·6	61·3	40·1	88·8	36·0	0·82
29	30·099	49·0	50·4	44·8	53·6	45·1	76·8	40·9	0·85
30	30·223	49·9	50·2	43·4	53·4	42·2	83·0	40·0	0·78
31	30·161	51·0	51·8	44·8	56·6	46·4	93·5	45·0	0·79
Means & Sums	29·959	52·4	53·0	46·6	61·2	45·5	93·0	41·8	0·81

General Abstract.

Barometer:—

Maximum, 30·497 inches, on the 25th.
Minimum, 29·363 inches, on the 20th.
Range in the month, 1·134 inches.
Mean for the month, 29·959 inches, being 0·048 inches lower than the average for the preceding sixteen years.

Temperature of Air:—

Highest in the shade, 72·6°, on the 9th.
Lowest in the shade, 36·1, on the 16th.
Range in the month, 36·5°.
Greatest daily range, 24·9° on the 16th, and 24·6°, on the 26th.
Smallest daily range, 8·5°, on the 29th.
Mean daily range, 15·7°.
Mean for the month, 52·4°, being 0·9° lower than the average for the preceding sixteen years.

Temperature of Soil:—

On Surface—Mean, 53·0°, being 0·7° lower than the average for the preceding sixteen years.
Bulb 14 inches deep—Maximum, 38·1°; minimum, 31·0°; range in the month, 7·1°; mean, 34·8°.
Bulb 3 feet deep—Maximum, 61·3°; minimum, 55·0°; range in the month, 6·3°; mean, 58·4°, being 0·2° lower than the average for the preceding thirteen years.

Observatory for the Month ending 31st May 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	N. and N.E. ..	0	Fine and mild, but dull.
2	S.W.	0·053	Heavy dew; dull, with rain squalls, in a.m.; fine in p.m.
3	S.E.	0	Heavy dew; fine and pleasant in a.m.; squally in p.m.
4	S.E.	0	Heavy dew; very fine and pleasant.
5	S.E. and E. ..	0·024	Heavy dew; dull, foggy, and showery in a.m.; fine in p.m.
6	E and N.E. ..	0·400	Gentle, steady rain all day.
7	N. and N.E. ..	0·129	Light rain showers in a.m.; fine in p.m.
8	N.E.	0·043	Heavy dew; fine, but dull, in a.m.; light rain in p.m.
9	N.E.	0	Heavy dew; very fine and pleasant.
10	N.E.	0	Heavy dew; fine, but dull; sheet lightning in S. and W. during evening.
11	N. and N.W...	0	Fine, but dull.
12	W.	0·090	Dull, squally, and cold in a.m.; very boisterous, with rain squalls, in p.m.
13	W. and S.W...	0	Fine, but dull and cold.
14	N.E. and S.W.	0	Heavy dew; fine and cold.
15	N.E.	0	Heavy dew; very fine and pleasant, but cold.
16	N.E.	0	Dense fog and heavy dew in morning and evening; very fine and clear all day.
17	N.E.	0	Heavy dew; fine and pleasant and very cold.
18	N.	0·051	Fine, but rather boisterous.
19	N.	0	Fine and pleasant in a.m.; dull and squally in p.m.; lightning in evening in N.W. and S.W.
20	W. and N.W.	0·234	Dull and very boisterous and squally, with rain showers occasionally.
21	N.	0·018	Heavy dew; fine and cold in a.m.; dull and boisterous, with scattered rain, in p.m.
22	W. and N.W.	0·514	Very boisterous, with heavy squalls and rain showers.
23	W.	0·033	Fine and pleasant in a.m.; squally, with light rain showers, in p.m.
24	S.W. and W.	0·067	Fine, but cold and dull; rain squalls in evening.
25	S.W. and W...	0·023	Fine, but dull and hazy.
26	N.E. and N...	0	Heavy dew; very fine and pleasant.
27	N.E.	0	Heavy dew; very fine and pleasant.
28	N.E. and N. ..	0	Heavy dew; very fine and pleasant.
29	N.E.	0·294	Dull, cold, and showery.
30	S.	0·020	Heavy dew; dull, with occasional misty rain.
31	S.W.	0·073	Dull and gloomy, with drizzling rain occasionally.
..	..	2·066	

MAY 1874.

Temperature of Soil—*continued.*

Bulb 6 feet deep—Maximum, 63·7°; minimum, 59·2°; range in the month, 4·5°; mean, 61·6°, being 0·2° lower than the average for the preceding thirteen years.

Bulb 8 feet deep—Maximum, 63·8°; minimum, 60·6°; range in the month, 3·2°; mean, 62·2°, being 0·1° lower than the average for the preceding thirteen years.

Solar Radiation:—

Maximum, 110·9°, on the 1st.

Terrestrial Radiation:—

Minimum, 32·8°, on the 17th.

Humidity of Air:—

Mean 81 (that of Saturation being represented by 100), being 3 higher than the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 46·6°, being 0·5° higher than the average for the preceding fifteen years.

Rain fell on fifteen days, to the amount of 2·07 inches, being 0·04 inches less than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
		Air.	Surface Soil.	Dew-point.	In Shade.		Radiation.		
	Mean.				Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	30·258	50·9	51·9	42·9	55·0	48·1	75·3	46·3	0·74
2	30·303	46·9	47·2	38·9	56·6	35·9	96·2	31·1	0·74
3	30·295	50·5	50·9	42·2	57·0	45·2	79·9	40·0	0·73
4	30·223	50·9	49·6	41·7	58·2	42·6	98·9	38·0	0·71
5	30·127	52·7	49·6	42·0	60·1	43·6	100·0	37·2	0·67
6	29·888	56·0	51·0	46·7	62·5	46·9	89·0	40·1	0·71
7	29·724	52·5	49·7	45·0	55·5	49·4	84·1	44·6	0·75
8	30·158	48·1	48·3	42·5	52·8	44·8	91·6	41·0	0·81
9	30·346	48·6	50·7	43·9	54·6	45·6	90·5	41·5	0·84
10	30·205	46·4	49·1	41·9	55·4	42·9	87·6	36·8	0·84
11	30·071	44·1	47·1	40·8	49·2	39·3	51·3	36·0	0·88
12	29·924	43·6	48·3	41·8	46·2	38·3	50·1	33·0	0·93
13	29·717	49·1	50·5	46·6	54·0	42·2	58·0	41·2	0·91
14	29·833	50·2	50·7	44·8	56·5	45·1	84·5	42·8	0·82
15	29·951	40·6	43·8	36·4	51·1	32·1	80·8	29·5	0·85
16	30·020	44·5	44·0	38·2	57·3	33·9	82·5	30·8	0·79
17	30·059	51·8	49·1	42·9	61·0	40·3	87·2	35·0	0·72
18	29·987	52·3	48·6	43·2	58·0	45·2	58·1	38·9	0·71
19	29·914	53·6	51·4	44·6	57·4	49·0	61·0	44·8	0·72
20	29·370	52·4	49·6	41·3	55·4	46·4	..	42·0	0·66
21	29·410	49·0	48·1	42·9	53·5	45·0	..	44·0	0·79
22	29·722	49·8	48·4	42·3	56·6	45·3	65·5	40·9	0·75
23	29·955	48·9	48·6	43·6	56·7	46·4	..	42·3	0·82
24	30·135	49·9	50·2	44·9	57·0	44·5	81·1	40·9	0·83
25	30·214	47·1	49·3	42·7	53·7	42·0	85·9	40·0	0·85
26	30·133	43·4	45·2	38·7	55·1	32·9	82·1	30·8	0·84
27	39·989	44·1	45·5	39·0	56·0	31·8	88·4	28·6	0·82
28	29·852	48·3	48·8	42·0	53·8	41·0	76·9	37·0	0·79
29	30·006	49·8	48·8	44·2	55·2	45·1	72·0	40·0	0·81
30	30·063	50·9	50·8	44·1	60·0	47·6	80·0	41·6	0·77
Means & Sums	29·995	48·9	48·8	42·4	55·7	42·6	79·2	38·6	0·79

GENERAL ABSTRACT:

Barometer:

Maximum, 30·388 inches, on the 9th.
Minimum, 29·256 inches, on the 20th.
Range in the month, 1·132 inches.
Mean for the month, 29·995 inches, being 0·007 inches lower than the average for the preceding sixteen years.

Temperature of Air:—

Highest in the shade, 62·5°, on the 6th.
Lowest in the shade, 31·8°, on the 27th.
Range in the month, 30·7°.
Greatest daily range, 24·2°, on the 27th.
Smallest daily range, 6·1°, on the 7th.
Mean daily range, 13·1°.
Mean for the month, 48·9°, being 0·9° lower than the average for the preceding sixteen years.

Temperature of Soil:—

On Surface—Mean, 48·8°, being 0·7° lower than the average for the preceding sixteen years.
Bulb 3 feet deep—Maximum, 55·0°; minimum, 51·2°; range in the month, 3·8°; mean, 53·1°, being 0·6° lower than the average for the preceding thirteen years.

Observatory for the Month ending 30th June 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. — Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	S.W. and S. ..	0	Fine and mild, but dull.
2	N.E. and N. ..	0	Heavy dew; frosty morning; fine, but dull, in p.m.; lunar halo.
3	N.	0	Fine, but dull.
4	N.E. and N. ..	0	Heavy dew; fine and pleasant, and very mild.
5	N.E.	0	Fine and pleasant.
6	N.	0·040	Fine and pleasant in a.m.; dull and showery in p.m.
7	N.	0	Fine, but boisterous, all day; dull, with rain squalls, in evening.
8	S.W. and S. ..	0·173	Fine, but cold and boisterous, with occasional rain squalls.
9	S.E.	0·013	Fine, but dull, with misty rain occasionally.
10	S.E.	0	Fine, but dull and foggy.
11	N. and N.W...	0	Dull and misty all day; fine, cold, and clear in evening.
12	N. and N.W...	0	Cold, dull, and foggy; dense fog in early morning and evening.
13	N. and S. ..	0·003	Dull and foggy.
14	S.	0·066	Dull and boisterous, with rain squalls all day; fine, clear, and cold in evening.
15	S.W. and S.E.	0·014	Dense fog, with hoar-frost and ice in morning; very fine in p.m.; frost in evening.
16	N.E.	0	Sharp frost in morning; very fine and clear all day.
17	N.E.	0	Fine, mild, and pleasant all day.
18	N.	0·012	Dull and boisterous, with light rain showers.
19	N. and N.E. ..	0·024	Fine, but dull; scattered rain in a.m.
20	N.E.	0·196	Dull, boisterous, and threatening all day; heavy rain in evening.
21	W. and N.W.	0·583	Dull, and very boisterous and squally, with heavy rain showers.
22	N.W. and W.	0·034	Fine in a.m.; dull, boisterous, and showery in p.m.
23	N.W.	0·008	Fine and pleasant, but dull, in a.m.; showery in p.m.
24	S.W.	0·187	Dull and showery in a.m.; fine and pleasant in p.m.; showery in evening.
25	S.E. and S. ..	0·007	Dense fog in morning; very fine and pleasant in p.m.
26	N.W and S.E.	0	Dense fog in early morning and during evening; very fine and pleasant all day.
27	N.E.	0	Hoar-frost and ice in early morning; delightful and clear all day; evening dull.
28	N.	0·092	Light rain in night; fine and pleasant, but dull, all day.
29	N.	0	Fine and pleasant all day.
30	N.	0	Fine and mild, but dull.
..	..	1·452	

JUNE 1874.

Temperature of Soil—*continued.*

Bulb 6 feet deep—Maximum, 59·0°; minimum, 55·7°; range in the month, 3·3°; mean, 57·3°, being 0·2° lower than the average for the preceding thirteen years.

Bulb 8 feet deep—Maximum, 60·3°; minimum, 57·5°; range in the month, 2·8°; mean, 58·9°, being 0·2° lower than the average for the preceding thirteen years.

Solar Radiation:—

Maximum, 100·0°, on the 5th.

Terrestrial Radiation:—

Minimum, 28·6°, on the 27th.

Humidity of Air:—

Mean, 79 (that of Saturation being represented by 100), being 2 lower than the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 42·4°, being 1·7° lower than the average for the preceding fifteen years.

Rain fell on twelve days, to the amount of 1·452 inches, being 0·59 inches less than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
					In Shade.		Radiation.		
	Mean.	Air.	Surface Soil.	Dew-point.	Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	29·882	49·0	49·4	43·7	55·3	46·0	..	40·3	0·82
2	29·995	50·3	50·0	44·7	58·4	45·0	..	40·7	0·81
3	30·209	46·9	49·2	43·2	57·0	43·0	80·0	40·2	0·87
4	30·c77	48·5	50·0	42·4	55·0	44·0	79·0	39·0	0·79
5	29·914	50·4	50·2	43·5	58·7	43·0	73·0	38·1	0·77
6	29·951	45·8	46·5	39·9	51·1	43·1	59·2	..	0·80
7	30·138	47·8	46·4	39·0	56·8	38·4	86·4	33·9	0·71
8	29·718	48·0	45·3	38·8	49·2	44·9	..	37·9	0·70
9	29·676	46·7	45·9	38·0	50·3	40·9	77·5	38·8	0·72
10	30·c85	49·7	48·4	44·1	60·0	42·5	61·1	..	0·81
11	29·994	49·4	49·3	44·6	55·0	47·4	67·0	45·1	0·83
12	29·927	48·4	50·8	43·9	57·8	44·8	70·3	41·9	0·84
13	29·941	46·3	48·1	41·6	57·1	42·3	66·0	40·7	0·83
14	29·974	40·6	43·4	36·9	55·2	32·5	86·1	29·0	0·87
15	30·150	40·6	44·9	39·5	49·2	32·8	70·1	28·0	0·96
16	30·134	42·7	43·0	36·9	56·6	33·0	86·9	30·1	0·80
17	30·232	47·9	47·4	41·1	57·9	39·6	74·3	35·1	0·77
18	30·369	44·2	45·0	39·0	57·2	36·9	78·0	30·1	0·82
19	30·411	42·9	46·0	40·9	55·0	35·0	79·0	30·0	0·93
20	30·417	44·0	47·4	40·9	55·7	39·0	87·1	36·1	0·89
21	30·444	44·6	46·0	38·2	59·9	34·1	90·9	30·9	0·79
22	30·381	46·7	46·1	38·1	61·2	36·5	..	33·3	0·72
23	30·177	48·9	48·3	40·1	58·0	42·3	69·1	37·7	0·72
24	29·894	53·0	51·1	43·8	62·8	42·1	89·0	36·1	0·71
25	29·820	49·8	..	44·6	60·4	46·8	..	45·0	0·82
26	30·c92	46·3	48·5	41·4	55·7	40·1	67·0	37·0	0·83
27	30·222	46·2	48·2	42·1	53·0	41·9	64·0	37·2	0·86
28	30·152	40·5	45·1	38·9	51·0	33·6	76·4	30·1	0·94
29	30·054	43·5	44·0	37·5	57·4	33·9	86·7	30·3	0·79
30	29·964	44·4	44·9	35·9	57·3	35·9	85·1	30·8	0·72
31	29·750	40·8	43·7	35·8	53·5	30·0	..	26·0	0·82
Means & Sums	30·069	46·3	47·1	40·6	56·1	39·7	76·4	35·4	0·81

GENERAL ABSTRACT:

BAROMETER:—

Maximum, 30·500 inches, on the 21st.
Minimum, 29·466 inches, on the 9th.
Range in the month, 1·034 inches.
Mean for the month, 30·069 inches, being 0·070 inches higher than the average for the preceding sixteen years.

TEMPERATURE OF AIR:—

Highest in the shade, 62·8°, on the 24th.
Lowest in the shade, 30·0°, on the 31st.
Range in the month, 32·8°.
Greatest daily range, 25·8°, on the 21st.
Smallest daily range, 4·3°, on the 8th.
Mean daily range, 16·4°.
Mean for the month, 46·3°, being 1·4° lower than the average for the preceding sixteen years.

TEMPERATURE OF SOIL:—

On Surface—Mean, 47·1°, being 0·5° lower than the average for the preceding sixteen years.
Bulb 3 feet deep—Maximum, 52·0°; minimum, 48·9°; range in the month, 3·1°; mean, 50·3°, being 0·6° lower than the average for the preceding thirteen years.

Observatory for the Month ending 31st July 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. Prevailing. Direction.	Amount of Rain.	Remarks.
		inches.	
1	N.	0·150	Showery in a.m.; fine, but dull, in p.m.
2	N. and N.W.	0·123	Fine, but dull; showery in evening.
3	Southerly ..	0·082	Dense fog in a.m.; fine in p.m.
4	S. and S.W. ..	0	Fine, but dull and hazy.
5	W. and N.W.	0	Fine, but dull; light rain in evening.
6	W. and S.W...	0·628	Strong westerly gale, with heavy squalls and rain showers.
7	N. and W. ..	0	Fine and frosty in a.m.; cold and boisterous in evening.
8	N.	0·011	N.W. gale in night; dull and very boisterous all day.
9	W.	0·121	Westerly gale and heavy squalls all day; thunder and lightning and hail 5.30 a.m.
10	N.W.	0	Fine and pleasant in a.m.; dull and threatening in p.m.
11	N.	0	Fine, but dull.
12	N. and S.W. ..	0	Fine and pleasant, but cloudy.
13	S.E.	0	Dense fog in a.m.; fine, but cold and boisterous, in p.m.
14	S.E.	0	Dense fog and sharp frost in a.m.; fine and pleasant in p.m.
15	N.E.	0	Dense fog in a.m.; fine and clear in p.m.
16	N. and N.E. ..	0	Sharp frost early a.m.; very fine and clear all day.
17	N.W. and W.	0·017	Dull and showery in night; fine and pleasant all day.
18	N. and W. ..	0	Very fine and pleasant all day.
19	N.	0	Frosty morning; fine and pleasant all day.
20	N.E. and E. ..	0	Dense fog in a.m.; very fine and clear in p.m.
21	N.E. and N. ..	0	Sharp frost early morning; very fine and clear all day.
22	N.E. and N. ..	0	Heavy dew; fine and pleasant all day; lunar halo in evening.
23	N.E. and N. ..	0	Fine and pleasant, but dull.
24	N.	0	Fine and pleasant, and very mild; sheet lightning in evening.
25	N.	0·279	Dull and showery in a.m.; fine and pleasant in p.m.
26	S.	0	Very fine and pleasant.
27	S.	0	Heavy dew; fine, but dull, all day.
28	N.E.	0	Hoar-frost and dense fog in a.m.; lunar rainbow, 4 a.m.; fine and pleasant all day.
29	N.E. and N. ..	0	Hoar-frost; very fine, clear, and pleasant all day.
30	N.E. and N. ..	0	Very fine and pleasant.
31	S.	0·454	Hoar-frost and ice in early morning; steady rain in p.m.
..	..	1·865	

JULY 1874.

Temperature of Soil—*continued.*

Bulb 6 feet deep—Maximum, 55·6°; minimum, 53·3°; range in the month, 2·3°; mean, 54·4°, being 0·5° lower than the average for the preceding thirteen years.

Bulb 8 feet deep—Maximum, 57·3°; minimum, 54·9°; range in the month, 2·4°; mean, 56·1°, being 0·4° lower than the average for the preceding thirteen years.

Solar Radiation:—

Maximum, 90·9°, on the 21st.

Terrestrial Radiation:—

Minimum, 26·0°, on the 31st.

Humidity of Air:—

Mean, 81 (that of Saturation being represented by 100), being the same as the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 40·6°, being 1·2° lower than the average for the preceding fifteen years.

Rain fell on seven days, to the amount of 1·865 inches, being 0·11 inches less than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
		Air.	Surface Soil.	Dew-point.	In Shade.		Radiation.		
	Mean.				Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	29·882	46·9	45·6	38·7	53·0	43·4	89·3	..	0·73
2	30·021	41·4	43·6	37·4	46·0	37·0	..	34·1	0·86
3	30·063	37·8	42·1	32·4	53·8	30·0	89·4	28·0	0·81
4	30·028	38·2	41·9	32·0	49·0	30·0	80·0	27·9	0·78
5	29·966	41·9	43·6	34·4	57·3	29·3	87·2	26·2	0·75
6	30·089	45·8	45·5	39·7	56·6	36·2	80·0	30·3	0·79
7	30·211	45·1	47·4	42·6	54·8	39·3	73·0	35·9	0·91
8	30·166	46·0	48·7	41·7	56·8	41·8	87·0	37·1	0·85
9	29·985	43·6	44·0	35·3	56·3	34·4	85·9	30·0	0·72
10	29·844	52·5	47·2	41·3	60·0	41·0	95·9	37·0	0·66
11	29·862	49·8	49·0	40·9	59·0	44·5	95·0	38·8	0·90
12	29·961	48·4	48·1	38·6	59·7	43·9	93·6	38·0	0·69
13	30·050	46·2	48·9	39·8	56·8	40·0	94·2	35·0	0·78
14	29·900	48·3	48·1	39·6	62·0	35·6	96·3	32·9	0·72
15	29·789	49·5	49·3	42·5	61·2	43·0	97·3	40·0	0·77
16	29·778	48·0	48·5	40·7	60·5	36·6	91·5	33·2	0·76
17	29·553	51·6	50·3	43·5	62·0	47·0	90·1	41·8	0·74
18	29·800	47·9	47·3	39·9	58·7	43·3	94·1	39·0	0·74
19	30·039	51·3	49·7	42·7	62·7	41·9	93·0	36·2	0·72
20	30·100	53·2	53·0	41·8	65·1	46·6	97·1	41·7	0·65
21	30·113	53·8	52·0	43·4	68·1	40·7	101·7	36·6	0·68
22	29·891	56·0	50·6	40·0	63·5	44·5	88·2	40·2	0·55
23	29·418	56·1	55·1	48·4	64·2	50·3	..	48·6	0·75
24	29·233	48·3	48·1	39·5	58·0	43·5	81·0	38·0	0·71
25	29·558	45·6	46·4	41·1	49·9	43·2	..	..	0·84
26	29·875	46·9	49·4	41·5	53·4	42·0	94·7	..	0·81
27	29·837	48·5	50·1	41·1	60·1	42·3	88·9	..	0·75
28	29·789	50·0	53·0	40·0	58·4	43·3	92·8	37·3	0·68
29	29·859	48·1	52·0	39·9	56·0	40·3	88·8	34·7	0·73
30	29·864	42·6	46·1	35·8	54·0	42·0	..	38·0	0·77
31	30·175	48·5	50·6	40·3	56·9	39·8	85·6	..	0·73
Means & Sums	29·893	47·7	48·2	39·9	57·9	40·5	90·0	36·0	0·75

GENERAL ABSTRACT.

Barometer:—

Maximum, 30·235 inches, on the 7th.
Minimum, 29·118 inches, on the 24th.
Range in the month, 1·117 inches.
Mean for the month, 29·893 inches, being 0·099 inches lower than the average for the preceding sixteen years.

Temperature of Air:—

Highest in the shade, 68·1°, on the 21st.
Lowest in the shade, 29·3°, on the 5th.
Range in the month, 38·8°.
Greatest daily range, 28·0°, on the 5th.
Smallest daily range, 6·7°, on the 25th.
Mean daily range, 17·4°.
Mean for the month, 47·7°, being 2·4° lower than the average for the preceding sixteen years, and the lowest on record during that period, with the exception of August 1872, when it was 47·1°.

Temperature of Soil:—

On Surface—Mean, 48·2°, being 2·5° lower than the average for the preceding sixteen years, and the lowest on record, with the exception of August 1872, when it was 47·6°.
Bulb 3 feet deep—Maximum, 50·6°; minimum, 47·1°; range in the month, 3·5°; mean, 49·1°, being 1·4° lower than the average for the preceding thirteen years.

Observatory for the Month ending 31st August 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind.—Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	S.	0·288	Fine, cold; rain squalls in evening.
2	W.	0·186	Steady rain in a.m.; dull, but fine in p.m.
3	N.E.	0	Sharp frost and ice in night; fine, clear, and cold all day.
4	N.E.	0	Sharp frost and ice in night and evening; very fine all day.
5	N.W. and N.E.	0	Sharp frost and ice in night; fine and cold all day; dull in evening.
6	S.W. and W...	0·036	Fine and mild in a.m.; dull, with light rain showers, in p.m.
7	W. and S. ..	0·087	Dull and hazy, with light rain showers.
8	N.E.	0·009	Dense fog in early morning; fine and clear in p.m.
9	N. and N.E. ..	0	Heavy dew; fine and pleasant all day.
10	N. and N.E. ..	0	Fine and pleasant.
11	N.	0	Fine and mild; scattered drops of rain in p.m.; evening clear.
12	W. and N.W.	0·018	Fine and pleasant in a.m.; light rain showers in p.m.
13	W. and S.W...	0	Fine, mild, and foggy in a.m.; clear and cold in p.m.
14	N.E. and N. ..	0	Heavy dew; fine and clear all day; evening dull and gloomy.
15	N. and N.E. ..	0·098	Showers in night; dull and boisterous in a.m.; evening clear.
16	N.E.	0	Heavy dew; very fine and clear all day; showery late evening.
17	N.W. and N.	0·150	Lightning and rain in night and evening; dull and boisterous all day; rain squall at 5 p.m.
18	N.W.	0·024	Squally, with light rain showers.
19	N.	0	Fine, mild, and pleasant.
20	N. and N.E. ..	0	Fine, and very mild; scattered drops of rain occasionally.
21	N.E. and N. ..	0	Heavy dew; very fine, clear, and mild.
22	N. and N.E. ..	0	Fine and mild in a.m.; boisterous and dusty in p.m.
23	N.	0·149	Boisterous, squally, and showery in a.m.; dull and gloomy in p.m.
24	N.W. and W.	0·054	Strong gale from 10 a.m., with heavy squalls and light rain at intervals.
25	W.	0·543	Strong gale, with heavy squalls and rain showers; moderating towards evening.
26	W. and S.W...	0·161	Dull and showery.
27	N.	0	Fine and pleasant.
28	N.E. and N.W.	0	Fine and pleasant; evening clear.
29	N. and S.W. ..	0·022	Dull, with light rain showers, in a.m.; fine and cold in p.m.
30	W.	0·097	Fine, but boisterous and cold, in a.m.; violent squalls and rain in p.m.; lightning in evening.
31	W.	0·033	Dull, with light rain showers; evening fine.
	..	1·955	

AUGUST 1874.

Temperature of Soil—*continued.*

Bulb 6 feet deep—Maximum, 53·1°; minimum, 52·1°; range in the month, 1·0°; mean, 52·5°, being 0·9° lower than the average for the preceding thirteen years.

Bulb 8 feet deep—Maximum, 54·8°; minimum, 53·6°; range in the month, 1·2°; mean, 53·9°, being 0·6° lower than the average for the preceding thirteen years.

Solar Radiation:—

Maximum, 101·7°, on the 21st.

Terrestrial Radiation:—

Minimum, 29·3°, on the 5th.

Humidity of Air:—

Mean, 75 (that of Saturation being represented by 100), being 1 lower than the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 39·9°, being 2·3° lower than the average for the preceding fifteen years, and the lowest on record during that period.

Rain fell on fifteen days, to the amount of 1·95 inches, being 0·07 inches less than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
					In Shade.		Radiation.		
	Mean.	Air.	Surface Soil.	Dew-point.	Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	30·063	52·2	52·5	37·6	62·8	40·6	98·3	34·3	0·58
2	29·785	55·1	50·4	40·6	58·7	51·4	63·1	44·1	0·58
3	29·562	59·9	51·8	42·4	64·0	52·8	73·0	49·0	0·52
4	29·608	57·9	53·1	43·9	65·9	52·3	98·9	47·1	0·60
5	29·745	51·4	50·9	38·5	61·0	43·6	89·4	36·9	0·61
6	29·553	46·1	45·9	33·9	56·6	41·0	..	36·0	0·62
7	29·721	44·1	45·5	34·0	51·6	38·2	77·9	..	0·68
8	30·021	46·5	51·9	40·5	52·6	41·4	98·7	38·5	0·79
9	30·116	48·9	52·3	41·5	54·8	43·4	91·7	39·1	0·76
10	30·056	46·0	51·7	42·2	55·1	36·0	92·9	30·2	0·86
11	30·007	46·3	54·7	43·2	55·2	37·5	96·0	32·1	0·89
12	29·974	45·5	54·6	40·2	56·8	34·0	101·9	30·0	0·82
13	29·848	50·4	56·1	43·1	66·5	36·4	98·0	33·8	0·76
14	29·551	51·5	56·7	47·7	58·6	48·7	97·0	46·1	0·87
15	29·691	50·9	54·2	49·0	61·4	49·0	..	44·7	0·93
16	29·851	51·7	58·1	48·1	61·2	48·2	99·9	39·1	0·87
17	29·901	51·3	56·5	44·7	61·0	42·6	100·3	39·2	0·78
18	29·658	53·4	54·4	42·0	62 3	44·1	96·3	42·1	0·65
19	29·616	48·2	50·4	40·0	60·5	38·1	..	..	0·73
20	29·252	46·9	49·1	40·3	53·4	39·6	..	35·7	0·78
21	29·598	46·7	49·5	40·7	53·9	42·9	82·0	38·0	0·80
22	29·896	52·8	53·1	41·9	64·7	40·9	100·4	34·2	0·66
23	29·892	54·8	55 6	45·0	69·2	44·6	104·1	40·8	0·69
24	29·690	57·8	55·9	42·0	69·4	50·5	106·9	45·0	0·56
25	29·590	53·3	57·5	47·1	60·6	51·0	87·2	50·0	0·80
26	29·508	51·1	54·6	44·7	56·8	47·2	76·8	46·2	0·79
27	29·730	46·7	50·7	44·1	51·6	45·1	..	..	0·91
28	29·914	48·4	54·3	38·0	56·6	39·4	99·1	35·0	0·67
29	30·062	49·3	53·5	39·4	55·7	41·2	100·0	37·9	0·68
30	30·249	48·6	54·6	41·1	60·7	40·8	101·0	35·2	0·75
Means & Sums	29·790	50·5	53·0	41·9	59·3	43·4	93·2	39·3	0·73

GENERAL ABSTRACT:

Barometer:—

Maximum, 30·295 inches, on the 30th.
Minimum, 29·175 inches, on the 20th.
Range in the month, 1·120 inches.
Mean for the month, 29·790 inches, being 0·124 inches lower than the average for the preceding sixteen years, and the lowest on record with the exception of September 1867, when it was 29·743 inches.

Temperature of Air:—

Highest in the shade, 69·4°, on the 24th.
Lowest in the shade, 34·0°, on the 12th.
Range in the month, 35·4°.
Greatest daily range, 30·1°, on the 13th.
Smallest daily range, 6·5°, on the 27th.
Mean daily range, 15·9°.
Mean for the month, 50·5°, being 2·8° lower than the average for the preceding sixteen years, and the lowest on record during that period.

Temperature of Soil:—

On Surface—Mean, 53·0°, being 2·4° lower than the average for the preceding fifteen years, and the lowest on record, with the exception of September 1863, when it was 52·6°.

Observatory for the Month ending 30th September 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. — Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	N.	0	Heavy dew; fine and pleasant all day; evening dull and gloomy.
2	N.	0	Boisterous and threatening in a.m.; dull and very mild in p.m.
3	N.	0	Fine and mild, but dull; heavy northerly gale in evening, with lightning.
4	N.W.	0	Fine and very warm; boisterous in evening, with lightning in S.E.
5	N.W.	0	Fine and pleasant; evening dull and gloomy.
6	W.	0·068	Strong gale, with heavy squalls and rain showers.
7	W.	0·104	Gale moderated, but still very boisterous and squally and cold.
8	S.W. and W...	0·099	Rain squalls in a.m.; fine and mild, but dull, in p.m.
9	S.W. and calm	0	Fine and mild, but dull.
10	S.W. and calm	0	Heavy dew; fine and pleasant all day.
11	S.W. and calm	0	Fine and pleasant, but foggy; evening clear and frosty.
12	N.E.	0	Beautiful, cloudless day; heavy fog in evening.
13	N. and N.E. ..	0·267	Fine and very warm all day; smart rain showers in evening.
14	E.	0·147	Dull and showery, and very mild.
15	N.W. and N...	0·504	Dull and murky; thunderstorm at 2 p.m., with heavy showers of rain and hail.
16	S.	0·050	Dull and gloomy in a.m.; fine and pleasant in p.m.
17	W. and N.E. ..	0	Fine and pleasant.
18	W.	0·016	Fine, but boisterous and squally.
19	N.E. and N.W.	0·062	Fine, but dull, in a.m.; rain and hail in p.m.
20	N.E. and N.W.	0·174	Dull, squally, and showery.
21	S.W. and S. ..	0·276	Dull and showery, with heavy squalls.
22	N.W.	0·027	Fine and mild; evening showery.
23	N.	0·046	Fine and very warm.
24	N.	0·053	Fine and very warm; evening dull and showery.
25	S. and W. ..	0·077	Dull, sultry, and showery in a.m.; fine in p.m.
26	S.	0·223	Dull and showery; cold, with steady rain, in evening.
27	S.W. and S.E.	0·616	Dull, gloomy, and showery.
28	S.W. and S. ..	0	Very fine and pleasant.
29	S. and S.E. ..	0·035	Fine and pleasant, with cool, strong breeze.
30	S.E. and S. ..	0	Heavy dew; very fine and pleasant.
..	..	2·844	

SEPTEMBER 1874.

Temperature of Soil—*continued.*

Bulb 3 feet deep—Maximum, 52·9°; minimum, 49·9°; range in the month, 3·0°; mean, 51·1°, being 2·3° lower than the average for the preceding twelve years, and the lowest on record, with the exception of September 1863, when it was 50·8°.

Bulb 6 feet deep—Maximum, 54·0°; minimum, 52·9°; range in the month, 1·1°; mean 53·3°, being 1·4° lower than the average for the preceding twelve years.

Bulb 8 feet deep—Maximum, 54·0°; minimum, 53·5°; range in the month, 0·5°; mean, 53·7°, being 1·2° lower than the average for the preceding twelve years.

Solar Radiation:—

Maximum, 106·9°, on the 24th.

Terrestrial Radiation:—

Minimum, 30·0°, on the 12th; 30·2°, on the 10th.

Humidity of Air:—

Mean, 73 (that of Saturation being represented by 100), being 1 higher than the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 41·9°, being 2·0° lower than the average for the preceding fifteen years, and the lowest on record.

Rain fell on eighteen days, to the amount of 2·84 inches, being 0·44 inches more than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
		Air.	Surface Soil.	Dew-point.	In Shade.		Radiation.		
	Mean.				Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	Inches.	°	°	°	°	°	°	°	Sat. = 1.
1	30·312	49·9	55·1	39·8	72·7	37·2	105·3	32·6	0·68
2	30·217	56·7	59·2	42·4	71·0	40·2	108·3	36·1	0·59
3	30·011	57·9	60·0	46·2	73·0	51·2	109·4	49·3	0·65
4	30·046	53·6	56·0	44·5	61·4	46·2	103·0	45·0	0·71
5	30·202	50·7	57·5	40·2	57·1	47·8	98·9	46·3	0·67
6	30·231	51·6	59·8	43·1	61·7	46·3	101·6	43·3	0·73
7	30·099	60·3	60·8	45·5	76·0	40·1	112·7	37·1	0·58
8	30·040	60·3	63·9	47·8	70·2	52·2	107·0	48·0	0·63
9	30·151	55·2	62·9	48·9	68·9	44·1	110·2	40·2	0·79
10	30·021	63·9	65·9	50·0	81·2	44·4	116·2	40·1	0·61
11	29·802	75·1	69·3	46·9	88·0	63·0	121·0	57·5	0·37
12	29·855	68·2	67·7	55·8	83·9	51·4	114·0	48·0	0·65
13	29·904	66·8	69·0	48·6	81·0	53·9	116·9	49·0	0·52
14	30·023	56·5	63·3	48·1	67·0	51·1	109·4	48·0	0·74
15	30·018	59·6	67·6	50·7	68·9	50·6	108·0	46·0	0·72
16	29·990	62·2	69·6	52·5	78·7	57·2	113·0	52·6	0·71
17	30·108	58·2	68·1	53·1	66·0	50·0	106·0	44·4	0·83
18	29·974	74·4	75·1	51·9	88·5	52·2	121·0	48·0	0·45
19	29·975	69·9	70·2	58·8	81·0	60·5	93·2	60·0	0·68
20	30·110	55·9	63·1	44·9	62·7	53·2	97·3	50·4	0·67
21	30·173	52·7	59·7	41·5	59·9	45·4	88·1	41·2	0·66
22	30·125	54·1	63·2	44·4	61·1	49·3	102·0	46·1	0·70
23	30·010	55·3	65·5	47·6	62·2	49·4	105·1	44·9	0·75
24	29·711	58·2	71·4	55·6	70·2	49·1	75·3	42·0	0·91
25	29·484	62·0	63·4	58·2	78·0	54·9	104·5	..	0·87
26	29·664	57·4	60·1	47·6	67·3	50·0	104·5	45·2	0·70
27	29·926	57·0	60·8	44·6	71·0	48·6	114·0	43·7	0·63
28	30·087	57·0	65·1	46·4	67·9	48·4	108·2	43·9	0·68
29	29·990	58·7	68·6	49·7	71·0	46·8	109·3	42·1	0·72
30	29·852	60·1	70·0	50·1	71·3	51·0	111·1	47·8	0·70
31	29·859	55·1	61·5	44·6	65·0	48·9	110·2	..	0·68
Means & Sums	29·999	59·2	64·0	48·1	71·1	49·5	106·6	45·5	0·68

GENERAL ABSTRACT.

Barometer:—

Maximum, 30·366 inches, on the 1st.
Minimum, 29·388 inches, on the 25th.
Range in the month, 0·978 inches.
Mean for the month, 29·999 inches, being 0·119 inches higher than the average for the preceding sixteen years.

Temperature of Air:—

Highest in the shade, 88·5°, on the 18th.
Lowest in the shade, 37·2°, on the 1st.
Range in the month, 51·3°.
Greatest daily range, 36·8°, on the 10th.
Smallest daily range, 9·3°, on the 5th.
Mean daily range, 21·6°.
Mean for the month, 59·2°, being 2·01° higher than the average for the preceding sixteen years and the highest on record with the exception of October 1873, when it was 59·3°.

Temperature of Soil:—

On Surface—Mean, 64·0°, being 2·0° higher than the average for the preceding sixteen years.
Bulb 14 inches deep—Maximum, 40·9°; minimum, 32·6°; range in the month, 8·3°; mean, 37·1°.

Observatory for the Month ending 31st October 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind.—Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	N.E. and S. ..	0	Very heavy dew; beautiful, clear day.
2	N.E. and N. ..	0	Very fine and clear.
3	N.	0·050	Dull and very warm in a.m.; cool in p.m.; rain shower at 5 p.m.
4	S.	0	Fine, cool, and pleasant.
5	S.	0	Fine, cool, and pleasant.
6	S.E.	0	Very fine and pleasant; heavy dew in evening.
7	N. and N.E. ..	0	Heavy dew; fine and very warm.
8	S. and N. ..	0	Fine and pleasant; heavy dew in evening.
9	S.	0	Heavy dew; very fine and pleasant.
10	N.E. and N. ..	0	Heavy dew; beautiful, clear morning; fine, but hot, in p.m.
11	N.	0	Fine, but hot, and very boisterous and dusty.
12	W.	0	Heavy dew; fine and pleasant in a.m.; hot in p.m.; thunder and lightning after 11 p.m.
13	N.W. and W.	0·010	Heavy dew; fine, but hot.
14	W. and S. ..	0	Heavy dew; fine, cool, and pleasant.
15	S.E.	0	Heavy dew; fine, cool, and pleasant.
16	S. and N. ..	0	Fine, but dull and sultry; sheet lightning in evening in S.E.
17	S.W. and S.E.	0	Heavy dew; very fine, cool, and pleasant; sheet lightning in N.W. in evening.
18	N.	0	Heavy dew; fine, but hot and boisterous; sheet lightning from N. round W. to S. all evening.
19	N.E.	0·035	Dull and sultry; showery in p.m.; lightning all evening.
20	S.	0·553	Fine, cool, and pleasant, but dull.
21	S.E. and S. ..	0	Fine, cool, and pleasant.
22	S.E.	0	Fine, cool, and pleasant.
23	S.E. and S.W.	0	Heavy dew; very fine, cool, and pleasant.
24	N.E.	0·474	Gentle, steady rain in a.m.; dull and sultry in p.m.
25	N. and N.E. ..	1·604	Thunderstorm at 4 a.m., and in afternoon with heavy rain; sheet lightning in S.E. in evening.
26	N.W.	0·053	Dull, boisterous, and showery.
27	W.	0·016	Fine and pleasant in a.m.; dull and showery in p.m.
28	W. and S. ..	0	Heavy dew; very fine and pleasant.
29	S.	0	Heavy dew; very fine and pleasant.
30	S. and S.W. ..	0	Heavy dew; very fine and pleasant.
31	W.	0·005	Boisterous and squally; lightning in S.E. in evening.
..	..	2·800	

OCTOBER 1874.

Temperature of Soil—*continued.*

Bulb 3 feet deep—Maximum, 60·3°; minimum, 52·3°; range in the month, 8·0°; mean, 57·4°, being 0·3° higher than the average for the preceding thirteen years.

Bulb 6 feet deep—Maximum, 59·0°; minimum, 54·0°; range in the month, 5·0°; mean, 56·7°, being 0·3° lower than the average for the preceding thirteen years.

Bulb 8 feet deep—Maximum, 57·6°; minimum, 54·0°; range in the month, 3·6°; mean, 55·6°, being 0·7° lower than the average for the preceding thirteen years.

Solar Radiation:—

Maximum, 121·0°, on the 11th and 18th.

Terrestrial Radiation:—

Minimum, 32·6°, on the 1st.

Humidity of Air:—

Mean, 68 (that of Saturation being represented by 100), being 2 lower than the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 48·1°, being 1·3° higher than the average for the preceding fifteen years.

Rain fell on seven days, to the amount of 2·80 inches, being 0·33 inches less than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
					In Shade.		Radiation.		
	Mean.	Air.	Surface Soil.	Dew-point.	Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	29·926	57·1	66·5	44·5	68·5	42·8	109·0	..	0·63
2	29·503	67·3	66·0	47·4	79·1	56·8	..	52·0	0·49
3	29·780	67·1	66·8	49·7	78·0	55·5	115·8	51·9	0·54
4	29·644	69·5	70·1	52·3	87·8	53·2	129·0	49·0	0·54
5	29·922	56·1	61·0	42·6	66·8	49·8	113·5	46·9	0·60
6	29·955	58·3	63·3	45·1	71·9	42·1	121·2	37·0	0·62
7	29·949	55·2	65·3	47·1	69·0	47·5	120·0	43·1	0·74
8	29·767	54·7	60·8	47·2	75·0	48·0	118·0	42·0	0·76
9	29·968	54·3	64·1	42·5	60·3	47·1	110·8	..	0·64
10	30·020	54·4	66·7	49·4	61·0	50·5	120·0	..	0·83
11	29·822	64·1	71·5	51·7	80·9	45·0	124·0	41·1	0·64
12	29·622	70·8	71·7	50·2	87·6	57·1	132·0	52·3	0·48
13	29·581	67·0	71·2	55·7	83·0	55·8	136·0	53·1	0·67
14	29·696	51·9	63·1	47·3	67·0	49·5	118·0	..	0·85
15	29·952	57·1	64·4	42·7	73·2	41·0	122·5	36·0	0·59
16	29·917	60·9	64·3	50·9	76·0	51·5	111·2	47·7	0·70
17	29·885	60·2	72·4	52·1	68·9	53·1	119·2	49·9	0·74
18	29·771	60·4	65·5	49·8	69·5	54·0	107·9	49·9	0·68
19	29·758	58·8	65 2	42·5	71·1	50·6	116·0	46·2	0·55
20	29·792	57·5	71·2	46·4	67·0	50 9	121·0	46·4	0·67
21	29·394	67·9	71·1	50·2	86·5	53·2	116·0	47·1	0·53
22	29·692	53·3	62·7	42·3	67·0	49·0	119·5	..	0·66
23	30·046	50·4	66·8	41·2	61·5	43·0	122·0	35·0	0·71
24	30·100	54·7	67·8	42·9	64·4	45·3	121·9	38·5	0·64
25	30·078	59·2	74·6	47·2	75·0	42·0	124·0	36·1	0·65
26	29·839	67·0	72·7	48·3	79·9	49·1	128·1	42·9	0·51
27	29·875	54·3	61·5	43·4	63·0	52·0	115·0	48·8	0·67
28	29·895	54·4	64·5	43·4	62·3	47·4	116·0	45·7	0·66
29	29·930	56·0	64·5	47·6	63·5	50·0	117·2	..	0·73
30	29·940	57·0	70·0	49·3	65·0	51·4	114·9	47·1	0·76
Means & Sums	29·834	59·2	66·9	47·1	71·7	49·5	119·3	45·2	0·65

GENERAL ABSTRACT:

Barometer:—

Maximum, 30·146 inches, on the 25th.
Minimum, 29·302 inches, on the 21st.
Range in the month, 0·844 inches.
Mean for the month, 29·834 inches, being 0·044 inches lower than the average for the preceding sixteen years.

Temperature of Air:—

Highest in the shade, 87·8°, on the 4th; 87·6° on the 12th.
Lowest in the shade, 41·0°, on the 15th.
Range in the month, 46·8°.
Greatest daily range, 35·9°, on the 11th.
Smallest daily range, 10·5°, on the 10th.
Mean daily range, 22·2°.
Mean for the month, 59·2°, being 1·6° lower than the average for the preceding sixteen years.

Temperature of Soil:—

On Surface—Mean, 66·9°, being 1·8° lower than the average for the preceding sixteen years.
Bulb 3 feet deep—Maximum, 61·8°; minimum, 60·0°; range in the month, 1·8°; mean, 60·9°, being 0·6° lower than the average for the preceding thirteen years.

Observatory for the Month ending 30th November 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. Prevailing. Direction.	Amount of Rain.	Remarks.
		inches.	
1	W. and N. ..	0	Heavy dew; fine and pleasant in a.m.; sultry in p.m.
2	N. and W. ..	0	Thunder and lightning 6 a.m.; dull, boisterous, and very warm after.
3	N.W. and W.	0	Fine and pleasant, but dull.
4	N.	0·145	Heavy dew; hot and boisterous all day; thunderstorm 5 p.m. and rain showers.
5	W.	0·061	Fine, cool, and boisterous.
6	W. and N. ..	0	Heavy dew; very fine and pleasant.
7	W. and S. ..	0	Heavy dew; very fine and pleasant.
8	W.	0·042	Heavy dew; fine and pleasant in a.m.; boisterous, with rain squalls, in p.m.
9	S.W.	0·012	Fine, but cold and boisterous; sheet lightning in S.W. in evening, with rain squalls.
10	S.	0·278	Squally with misty rain in a.m.; fine in p.m.
11	N.E. and N. ..	0	Heavy dew; very fine and clear.
12	N. and N.E. ..	0	Fine, but hot and boisterous.
13	S.E. and E. ..	0·021	Heavy dew; dull and sultry, with rain showers in evening.
14	W.	1·169	Heavy rain in night; dull and showery all day; fine and clear in evening.
15	N. and N.E. ..	0	Heavy dew; fine, but sultry; lunar halo.
16	N.E. and N. ..	0·016	Fine, but dull and sultry; light showers in evening.
17	S. and S.W. ..	0	Fine and pleasant.
18	W.	0·012	Fine, but dull.
19	W. and N.W...	0	Fine and pleasant, but dull.
20	S.E. and W. ..	0·005	Fine and cool, but dull.
21	N.E. and W...	0·005	Northerly gale, with clouds of dust, in a.m.; strong Westerly gale in p.m.
22	W.	0	Fine, but boisterous.
23	S.	0·036	Misty rain in a.m.; very fine in p.m.
24	S.E. and S. ..	0	Fine, cool, and pleasant.
25	E. and S.E. ..	0	Heavy dew; very fine and pleasant.
26	N. and N.E. ..	0	Heavy dew; dull, boisterous, and very warm; lightning all through the evening, with rain showers.
27	W. and S.W...	0·301	Fine, but boisterous, in a.m.; rain squalls in p.m.
28	S.W.	0·007	Fine, but dull and boisterous.
29	S.	0·010	Fine, but dull; light rain squalls in a.m.
30	S.	0	Fine, but dull, in a.m.; very pleasant in p.m.
..	..	2·120	

NOVEMBER 1874.

Temperature of Soil—*continued.*

Bulb 6 feet deep—Maximum, 61·2°; minimum, 59·2°; range in the month, 2·0°; mean, 60·3°, being 0·2° lower than the average for the preceding thirteen years.

Bulb 8 feet deep—Maximum, 59·5°; minimum, 57·8°; range in the month, 1·7°; mean, 58·6°, being 0·1° lower than the average for the preceding sixteen years.

Solar Radiation:—

Maximum, 136·0°, on the 13th.

Terrestrial Radiation:—

Minimum, 35·0°, on the 23rd; 36·0° on the 15th.

Humidity of Air:—

Mean, 65 (that of Saturation being represented by 100), being 2 lower than the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 47·1°, being 1·8° lower than the average for the preceding fifteen years.

Rain fell on twelve days, to the amount of 2·12 inches, being 0·12 inches less than the average rainfall for the preceding sixteen years.

Results of Meteorological Observations made at Melbourne

Lat. 37° 49′ 53″ S. Long. 9h. 39m. 54·8s. E.

Day of Month.	Barometer reduced to 32° Fahrenheit.	Mean Temperature.			Self-registering Thermometers.				Humidity.
		Air.	Surface Soil.	Dew-point.	In Shade.		Radiation.		
	Mean.				Max.	Min.	Solar Max.	Terrestrial Min.	Mean.
	inches.	°	°	°	°	°	°	°	Sat. = 1.
1	30·029	57·4	69·3	49·8	63·4	50·1	116·0	44·3	0·76
2	30·024	57·7	73·1	51·2	66·0	50·0	117·9	45·9	0·79
3	29·987	62·6	78·9	54·6	72·0	57·4	124·0	54·8	0·75
4	29·810	77·1	81·4	58·2	94·6	53·2	139·9	45·0	0·52
5	29·804	62·7	82·6	51·7	76·6	60·0	122·0	58·0	0·67
6	29·724	75·9	85·0	58·4	99·1	55·3	137·0	51·2	0·55
7	29·804	63·4	73·8	57·0	76·1	58·8	120·2	..	0·80
8	29·727	72·3	82·2	60·9	85·8	61·6	134·7	59·1	0·67
9	29·607	69·9	76·6	61·5	80·0	63·3	127·7	56·4	0·75
10	29·713	63·3	69·5	48·1	72·1	55·7	108·2	51·5	0·58
11	29·814	53·2	60·9	45·1	59·8	48·4	112·9	46·0	0·74
12	30·099	56·2	66·9	46·2	64·2	46·5	118·0	..	0·69
13	30·027	58·6	73·5	49·9	66·0	53·8	117·1	50·8	0·73
14	29·903	57·3	69·0	48·9	63·9	54·9	106·4	54·0	0·74
15	29·771	61·1	78·6	50·9	73·9	46·6	119·2	40·8	0·69
16	29·707	67·3	83·8	55·7	80·8	50·5	126·4	45·9	0·67
17	29·558	81·9	90·3	51·6	102·7	60·1	140·3	54·7	0·35
18	29·853	60·5	72·5	44·5	72·0	54·2	122·0	45·0	0·55
19	29·799	62·4	69·3	48·9	78·0	48·4	120·2	44·5	0·61
20	29·790	60·6	66·1	48·8	72·1	51·0	113·1	..	0·65
21	29·705	64·6	71·0	49·6	82·1	49·6	130·3	42·1	0·58
22	29·567	63·1	69·4	49·3	83·0	50·8	127·0	44·2	0·61
23	29·605	53·1	62·5	40·8	62·9	49·4	114·8	..	0·63
24	29·762	56·6	60·9	44·6	69·9	44·1	113·1	39·1	0·64
25	29·893	60·9	69·7	48·5	75·0	51·0	124·5	46·0	0·64
26	30·058	58·8	73·3	52·0	67·6	54·9	121·6	54·0	0·78
27	29·967	63·3	73·9	53·7	73·6	48·0	121·0	43·2	0·71
28	29·765	81·2	82·2	51·9	102·2	56·4	140·8	51·0	0·36
29	29·898	60·6	78·1	50·1	67·5	56·5	122·3	54·0	0·68
30	29·793	59·2	81·2	45·0	65·2	54·7	118·0	..	0·60
31	29·715	60·3	82·3	43·4	67·2	52·1	115·6	46·0	0·54
Means & Sums	29·815	63·3	74·4	50·7	75·3	53·1	122·3	48·7	0·65

GENERAL ABSTRACT:

Barometer:—

Maximum, 30·118 inches, on the 12th.
Minimum, 29·473 inches, on the 17th, and 29·481 inches on the 22nd.
Range in the month, 0·645 inches.
Mean for the month, 29·815 inches, being 0·005 inches higher than the average for the preceding sixteen years.

Temperature of Air:—

Highest in the shade, 102·7°, on the 17th; 102·2°, on the 28th.
Lowest in the shade, 44·1°, on the 24th.
Range in the month, 58·6°.
Greatest daily range, 45·8°, on the 28th.
Smallest daily range, 9·0°, on the 14th.
Mean daily range, 22·2°.
Mean for the month, 63·3°, being 0·6° lower than the average for the preceding sixteen years.

Temperature of Soil:—

On Surface—Mean, 74·4°, being 0·9° higher than the average for the preceding sixteen years.
Bulb 3 feet deep—Maximum, 65·6°; minimum, 61·1°; range in the month, 4·5°; mean, 64·1°, being 1·0° lower than the average for the preceding thirteen years.

Observatory for the Month ending 31st December 1874.

Height above Sea-level, 91 feet.

Day of Month.	Wind. — Prevailing Direction.	Amount of Rain.	Remarks.
		inches.	
1	S.	0·079	Dull and showery in a.m.; fine and pleasant in p.m.
2	S.W. and S.E.	0	Dull and close in a.m.; fine, clear, and pleasant in p.m.
3	S.W. and S. ..	0	Heavy dew; close and sultry in a.m.; very fine in p.m.
4	N.	0	Heavy dew; fine, but very hot; lightning in S.E. in evening.
5	S. and S.W. ..	0	Fine, but sultry, in a.m.; cool fresh breeze in p.m.
6	N.E.	0·239	Dull, and very hot and sultry; heavy thunderstorm at $4^{h}\cdot30^{m}$. p.m., with hail; lightning in N. and W. all evening.
7	S.	0	Dull and sultry.
8	S.	0	Fine, but dull, and very close; thunder and lightning and rain showers in evening.
9	S.W. and W.	0·070	Dull and sultry, with thunder and lightning and rain showers, in a.m.; fine and pleasant in p.m.
10	W. and S.W.	0	Fine, cool, and pleasant, but dull.
11	S.W. and W.	0·250	Dull, boisterous, squally, and showery.
12	S.	0·094	Squally and showery in night; fine, but dull, all day.
13	S.W. and S. ..	0·014	Fine, but dull and boisterous.
14	S. and S.W. ..	0	Dull in a.m.; fine, cool, and pleasant in p.m.
15	S.W. and S. ..	0	Dull in a.m.; very fine, clear, and pleasant in p.m.
16	S.E. and S. ..	0	Heavy dew; fine, but rather hot.
17	N. and N.E...	0	Fine, and very hot; cool in evening, with incessant lightning and distant thunder.
18	W. and S.W.	0·318	Heavy showers in night; fine, cool, and pleasant all day.
19	N.E. and N.W.	0·100	Heavy dew; fine, but sultry; heavy squall and duststorm at 4 p.m.
20	N.W. and W.	0	Fine, but cloudy; evening clear and mild.
21	W. and N.W.	0	Heavy dew; fine and pleasant in a.m.; very warm in p.m.
22	N.W.	0·205	Heavy dew; fine and pleasant in a.m.; dull and boisterous and heavy squalls in p.m.
23	W. and S.W.	0·480	Heavy showers in night; fine and pleasant in a.m.; boisterous and showery in p.m.
24	W.	0	Fine and cool, but dull.
25	W. and S. ..	0	Fine and pleasant.
26	S.E. and S. ..	0·065	Drizzling rain in night; very fine and pleasant all day.
27	S.W. and S.E.	0	Heavy dew; very fine and pleasant.
28	N.	0	Heavy dew; hot wind and clouds of dust; incessant lightning in S. and W. all evening.
29	S.	0·010	Dull, with scattered rain, in a.m; very fine and pleasant in p.m.
30	S.	0	Very fine and pleasant; lightning in W. in evening.
31	S. and S.W. ..	0	Fine and pleasant.
..	..	1·924	

DECEMBER 1874.

Temperature of Soil—*continued.*

Bulb 6 feet deep—Maximum, 64·4°; minimum, 61·1°; range in the month, 3·3°; mean, 63·0°, being 0·7° lower than the average for the preceding thirteen years.

Bulb 8 feet deep—Maximum, 61·9°; minimum, 59·4°; range in the month, 2·5°; mean, 60·7°, being 0·6° lower than the average for the preceding thirteen years.

Solar Radiation:—

Maximum, 140·8°, on the 28th; 140·3° on the 17th.

Terrestrial Radiation:—

Minimum, 39·1°, on the 24th.

Humidity of Air:—

Mean, 65 (that of Saturation being represented by 100), being 1 higher than the average for the preceding sixteen years.

Temperature of Dew-point:—

Mean, 50·7°, being 0·1° lower than the average for the preceding fifteen years.

Rain fell on twelve days, to the amount of 1·92 inches, being 0·69 inches less than the average rainfall for the preceding sixteen years.

Yearly Rainfall

Years.	Melbourne.	Buninyong.	Ballarat.	Portland.	Camperdown.	Heathcote.	Beechworth.	Echuca.	Gabo Island.	Longerenong, Wimmera.	Sandhurst.	Ararat.	Cape Otway.	Werrackneebeal.	Stawell.	Berwick.	Daylesford.	Warrnambool.
1840	22·57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1841	30·18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1842	31·16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1843	21·54	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1844	23·26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1845	23·93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1846	30·53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1847	30·18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1848	33·15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1849	44·25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1850	26·98	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1851	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1852	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1853	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1854	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1855	28·21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1856	29·75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1857	28·90	25·29	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1858	26·02	26·11	24·47	27·30	27·97	23·79	30·87	—	—	—	—	—	—	—	—	—	—	—
1859	21·80	—	23·72	31·42	27·60	21·86	—	15·76	—	—	—	—	—	—	—	—	—	—
1860	25·40	25·49	28·80	26·31	29·97	29·01	—	19·13	32·82	17·26	—	—	—	—	—	—	—	—
1861	29·15	30·67	28·66	39·58	36·94	28·78	29·70	—	38·74	20·17	—	—	—	—	—	—	—	—
1862	22·08	26·79	23·50	31·01	26·15	16·99	26·94	—	—	—	18·50	23·35	—	—	—	—	—	—
1863	36·43	43·64	37·22	45·31	—	—	—	—	49·12	33·08	33·92	37·37	49·66	21·45	—	—	—	—
1864	27·40	25·75	24·02	33·06	—	—	—	—	—	—	23·03	—	38·82	8·81	—	—	—	—
1865	15·94	25·01	20·09	34·37	—	—	—	—	—	—	10·85	15·71	33·62	6·17	—	—	—	—
1866	22·41	28·68	23·35	31·75	—	—	—	—	—	—	21·41	18·21	34·29	14·17	18·57	—	—	—
1867	25·79	31·89	29·87	33·87	—	—	—	—	—	—	26·66	25·28	38·98	—	25·41	38·36	—	—
1868	18·27	22·74	17·23	30·32	—	—	—	—	26·28	—	17·34	23·27	31·99	—	17·55	29·81	31·74	27·58
1869	24·59	28·31	22·85	23·53	—	—	—	—	42·80	—	21·29	20·68	36·84	—	15·28	34·38	—	26·84
1870	33·75	41·72	36·38	—	—	—	—	—	—	—	38·37	28·20	36·60	—	29·39	46·38	50·70	—
1871	30·17	29·07	27·51	—	23·14	—	—	—	41·22	—	27·12	25·75	36·66	—	23·20	42·30	40·36	—
1872	32·52	36·14	31·81	37·01	34·12	—	—	—	36·86	—	26·25	28·79	37·60	—	29·95	51·40	42·50	—
1873	25·61	31·32	27·49	30·77	27·75	—	—	—	—	—	20·54	21·45	32·11	—	23·44	39·33	38·08	—
1874	28·10	—	27·83	32·11	36·45	—	36·12	—	—	—	19·58	23·16	42·44	—	—	42·27	35·96	—

AT DIFFERENT STATIONS.

Kew.	Mornington.	Katandra.	Wahgunyah.	Hamilton.	Amherst.	Geelong.	Sale.	Clunes.*	Durham Ox.	Hastings.	Kingston.	Port Albert.	Rokewood.	Warrandyte.	Wyndham.	Birregurra.	Kyneton.	Horsham.
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27·95	26·53	20·02	20·20	19·97	17·66	—	—	—	—	—	—	—	—	—	—	—	—	—
35·90	45·92	37·13	43·90	31·15	35·26	—	—	—	—	—	—	—	—	—	—	—	—	—
33·76	30·81	—	27·10	25·26	25·61	20·04	23·61	—	—	—	—	—	—	—	—	—	—	—
39·85	43·01	—	26·29	29·38	33·63	27·23	22·76	41·74	21·53	—	40·84	23·85	28·65	47·81	34·81	—	—	—
27·24	29·98	—	25·22	24·68	25·91	20·72	33·95	—	16·03	32·16	34·92	26·42	21·83	23·72	27·83	36·16	—	—
33·12	38·97	—	25·55	22·55	—	21·04	30·77	—	—	45·02	31·63	27·08	24·02	41·00	—	43·15	34·10	19·43

* Storage works Catchment Station.

Amount of Rainfall and Number of Days of Rain for every Month and for each Year, together with the Average Amount and Average Number of Days of Rain for every Month, at Melbourne, for the period of 17 Years (1858–1874).

Years.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		For the whole year.	
	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.	Amount.	Days.
	in.		in.		in.		in.		in.		in.		in.		in.		in.		in.		in.		in.		in.	
1858	0·83	9	4·91	12	1·09	9	0·60	11	1·38	15	0·76	13	2·07	18	1·62	16	2·17	22	0·87	10	3·19	11	6·47	12	26·01	158
1859	2·86	13	0·83	10	0·18	8	1·29	8	2·32	14	4·51	21	1·04	13	0·95	17	2·77	16	2·33	13	1·71	12	1·03	11	21·82	156
1860	1·97	10	1·03	4	0·93	6	4·53	12	0·99	11	1·72	16	1·21	9	0·79	10	2·72	17	1·97	15	2·38	12	5·06	11	25·38	133
1861	2·25	14	4·62	13	2·65	9	1·29	11	0·84	12	1·78	16	2·14	16	1·47	14	3·19	17	4·89	14	1·46	11	2·58	12	29·16	159
1862	1·25	4	0·19	3	1·03	8	3·56	14	4·31	19	2·99	16	2·26	20	1·95	14	0·93	14	2·03	11	0·32	9	1·16	7	22·08	139
1863	1·84	9	2·74	12	3·84	14	1·76	10	2·54	16	1·16	10	2·87	16	2·10	18	1·99	15	4·89	18	3·51	13	7·18	14	36·42	165
1864	2·07	7	2·63	9	1·80	7	4·53	18	1·02	9	0·81	10	2·83	13	2·50	18	2·23	14	4·08	18	0·64	9	2·21	12	27·40	144
1865	0·16	3	0·59	8	1·26	8	0·72	7	3·41	18	1·64	10	2·05	14	1·22	14	1·87	13	0·78	8	0·89	7	1·35	9	15·94	119
1866	1·43	4	0·35	5	2·14	6	0·57	5	2·92	7	1·64	11	2·04	11	2·26	15	2·03	14	3·25	15	2·17	10	1·56	4	22·41	107
1867	1·92	6	2·68	7	0·75	8	2·42	11	2·38	12	1·03	7	1·66	20	1·91	14	3·43	18	3·35	18	0·87	3	3·34	9	25·79	133
1868	2·11	10	0·99	6	1·02	5	1·44	10	1·48	8	1·21	11	1·46	15	1·01	10	2·13	15	1·05	11	3·19	11	1·18	8	18·27	120
1869	1·46	6	0·89	10	1·53	3	1·27	7	1·99	14	2·37	13	1·13	13	1·65	10	1·58	13	7·61	20	2·12	13	0·98	7	24·58	129
1870	3·15	4	0·03	1	0·34	3	4·88	15	2·78	10	3·32	21	3·16	14	2·14	15	5·87	17	4·38	12	3·23	13	0·49	4	33·77	129
1871	3·00	9	3·23	6	2·37	9	1·29	6	1·39	11	1·25	9	2·08	15	3·58	11	1·86	15	2·83	11	4·19	16	3·05	7	30·17	125
1872	4·98	12	0·99	5	1·82	7	1·50	13	2·43	14	3·66	17	2·17	13	2·83	13	1·31	8	2·86	11	4·50	14	3·47	9	32·52	136
1873	2·07	7	4·67	13	1·84	8	2·07	13	1·31	13	2·69	17	1·40	12	2·07	14	2·57	12	2·92	11	1·41	10	0·59	4	25·61	134
1874	2·14	6	0·88	5	6·36	19	1·71	6	2·07	15	1·45	12	1·86	7	1·95	15	2·84	18	2·80	7	2·12	12	1·92	12	28·10	134
Averages	2·09	7·8	1·90	7·6	1·82	8·0	2·08	10·4	2·09	12·8	2·00	13·5	1·97	14·0	1·88	14·0	2·45	15·2	3·11	13·1	2·23	10·9	2·56	8·9	26·20	136·5

Mean Temperature of Air at different Stations for every Month and for the Year 1874.

Months.	Portland.	Sandhurst.	Melbourne.	Berwick.	Beechworth.	Ballarat.	Cape Otway.	Mt. Macedon.	Stawell.
	°	°	°	°	°	°	°	°	°
January ...	68·6	71·8	65·7	65·0	73·8	67·5	60·4	62·9	69·8
February ...	67·6	68·9	64·6	63·8	68·6	64·8	59·6	60·1	...
March	65·3	63·8	62·4	61·3	62·0	60·6	59·0	58·7	...
April	65·3	61·3	58·9	59·6	59·0	57·7	57·9	56·4	58·7
May	60·1	52·2	52·4	53·2	48·6	49·8	53·9	47·1	51·8
June	55·9	47·4	48·9	49·3	43·6	46·9	51·5	42·5	48·8
July	54·2	45·9	46·3	47·3	41·4	43·3	48·5	40 5	45·0
August ...	54·7	47·3	47·7	48·6	42·6	44·6	48·7	41·1	47·2
September ...	56·0	49·3	50·5	49·3	46·2	48·1	49·7	43 8	50·4
October ...	62·9	61·6	59·2	58·4	59·6	58·5	54·7	55·7	60·5
November ...	62·5	61·4	59·2	57·8	59·6	58·0	55·1	54·4	61·4
December ...	64·8	68·4	63·3	61·6	68·1	62·1	57·1	60·0	66·2
Year ...	61·5	58·3	56·6	56·3	56·1	55·2	54·7	51·9	...

Mean Temperature of Air at different Stations for the Four Seasons and for the Year 1874.

Names of Stations.	Summer. Dec.–Feb.	Autumn. March–May.	Winter. June–August.	Spring. Sept.–Nov.	Year.
	°	°	°	°	°
Portland ...	68·2	63·6	54·9	60·5	61·8
Sandhurst ...	70·9	59·1	46·9	57·4	58·6
Melbourne ...	65·8	57·9	47·6	56·3	56·9
Berwick ...	64·8	58·0	48·4	55·2	56·6
Beechworth ...	...	56·5	42·5	55·1	...
Ballarat ...	66·6	56·0	44·9	54·9	55·6
Cape Otway ...	60·2	56·9	49·6	53·2	55·0
Mt. Macedon ...	62·5	54·1	41·4	51·3	52·3
Stawell ...	...	...	47·0	57·4	...

Maxima, Minima, and Range of Temperature of Air at Different Stations for every Month and for the Year 1874.

Months.	Sandhurst.			Melbourne.			Beechworth.			Ballarat.			Cape Otway.			Stawell.		
	Max.	Min.	Range.	Max.	Min.	Range.	Max.	Min.	Range.	Max.	Min.	Range.	Max.	Min.	Range.	Max.	Min.	Range.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
January ..	109·5	50·5	59·0	99·9	49·8	50·1	106·0	50·0	56·0	107·3	45·0	62·3	87·0	50·0	37·0	112·0	49·0	63·0
February ..	99 0	48·5	50·5	101·0	44·4	56·6	93·0	42·0	51·0	97·0	42·0	55·0	94·0	49·0	45·0	..	..	..
March	90·0	45·2	44·8	92·4	47·0	45·4	83·0	40·0	43·0	90·3	40·2	50·1	85·0	50·0	35·0	..	..	..
April	85·4	42·9	42·5	78·5	41·1	37·4	77·0	43·0	34·0	81·8	39 2	42·6	79·0	46·0	33·0	85·0	33·0	52·0
May	78·4	37·7	40·7	72·6	36·1	36·5	68·5	35·0	33·5	71·2	32·0	39·2	73·0	38·0	35·0	72·0	34·0	38·0
June	62·7	34·2	28·5	62·5	31 8	30·7	60·0	30·0	30·0	61·0	30·5	30·5	65·0	39·0	26·0	69·0	30·0	39·0
July	61·5	31·2	30·3	62·8	30·0	32·8	56·0	29·0	27·0	58·5	27·5	31·0	64·0	39·0	25·0	62·0	28·0	34·0
August ..	69·5	30·2	39·3	68·1	29·3	38·8	61·0	27·0	34·0	64·3	25·0	39·3	69·0	37·0	32·0	70·0	28·0	42·0
September ..	65·0	30·0	35·0	69·4	34·0	35·4	65·0	30·0	35·0	68·0	31·0	37·0	66·0	37·0	29·0	69·0	35·0	34·0
October ..	94·0	41·2	52 8	88·5	37·2	51·3	84·5	34·5	50·0	90·5	36·0	54·5	91·0	44·0	47·0	98·0	34·0	64·0
November ..	90·2	42·0	48·2	87·8	41·0	46·8	87·0	26·5	50 5	91·7	35·2	56 5	89·0	40·0	49·0	96·0	40·0	56·0
December ..	103·0	41·9	61·1	102·7	44·1	58·6	98·5	37·5	61·0	104·0	39·8	64·2	95·0	46·0	49·0	104·3	41·0	63·0
Extremes for the year	109·5	30·0	..	102·7	29·3	..	106·0	27·0	..	107·3	25·0	..	95·0	37·0	..	112·0	28·0	..
Greatest monthly range	..	..	61·1	..	..	58·6	..	..	61·0	..	..	64·2	..	..	49·0	..	..	64·0
Smallest monthly range	..	..	28·5	..	..	30·7	..	..	27·0	..	..	30·5	..	..	25·0	..	..	34·0
Yearly range..	..	..	79·5	..	..	73·4	..	..	79·0	..	..	82·3	..	..	58·0	..	..	84·0

Means, Extremes, and Range of Temperature of Soil at different Depths, at Melbourne Observatory, for every Month and for the Year 1874.

Months.	Bulb 3 feet deep.				Bulb 6 feet deep.				Bulb 8 feet deep.			
	Max.	Min.	Mean.	Range.	Max.	Min.	Mean.	Range.	Max.	Min.	Mean.	Range.
	°	°	°	°	°	°	°	°	°	°	°	°
January	70·0	67·2	68·8	2·8	68·4	66·3	67·4	2·1	65·6	63·4	64·5	2·2
February	71·9	68·7	70·0	3·2	69·8	68·6	69·2	1·2	67·0	65·9	66 6	1·1
March	69·4	65 2	67·6	4·2	69·0	66·9	68·2	2·1	67·0	65·5	66·4	1·5
April	65·9	61·3	64·0	4·6	66·5	63·9	65·4	2·6	65·5	63·9	64·7	1·6
May	61·3	55·0	58·4	6 3	63·7	59·2	61·6	4·5	63·8	60·6	62·2	3·2
June	55·0	51·2	53·1	3·8	59·0	55·7	57·3	3·3	60·3	57·5	58·9	2·8
July	52·0	48·9	50·3	3·1	55·6	53·3	54·4	2 3	57·3	54·9	56·1	2·4
August	50·6	47·1	49·1	3·5	53·1	52·1	52·5	1 0	54·8	53·6	53·9	1·2
September	52·9	49·9	51·1	3·0	54·0	52·9	53·3	1·1	54·0	53·5	53·7	0·5
October	60·3	52·3	57·4	8·0	59·0	54·0	56·7	5·0	57·6	54·0	55·6	3·6
November	61·8	60·0	60·9	1·8	61·2	59·2	60·3	2·0	59·5	57 8	58·6	1·7
December	65·6	61·1	64·1	4·5	64·4	61·1	63·0	3·3	61·9	59·4	60·7	2·5
Means	..	..	59·6	4·1	..	..	60·8	2·5	..	..	60·2	2·0
Extremes	71·9	47·1	..	24·8	69·8	52·1	..	17·7	67·0	53·5	..	13·5

Mean Temperature of Dew-point at different Stations for every Month and for the Year 1874.

Months.	Sandhurst.	Melbourne.	Beechworth.	Ballarat.	Cape Otway.	Portland.
	°	°	°	°	°	°
January ...	57·1	53·8	65·7	50·4	57·3	60·5
February ...	53·1	50·4	52·4	48·7	53·5	59·3
March ...	56·0	53·9	55·7	48·9	56·2	59·4
April	54·2	51·9	53·1	46·7	55·4	58·9
May	48·0	46·6	44·6	41·9	51·0	53·9
June	43·9	42·4	39·8	38·0	47·4	50·5
July	41·2	40·6	38·0	36·0	45·3	48·8
August ...	43·1	39·9	37·7	35·3	45·0	48·4
September ...	42·9	41·9	40·2	36·6	45·5	50·1
October ...	53·8	48·1	51·6	43·4	53·1	55·4
November ...	51·5	47·1	48·3	44·1	53·3	54·4
December ...	58·0	50·7	52·4	50·5	55·9	57·1
Year	50·2	47·3	48·3	43·4	51·6	54·7

Mean Temperature of Dew-point at different Stations for the Four Seasons and for the Year 1874.

Stations.	Summer. Dec.–Feb.	Autumn. March–May.	Winter. June–August.	Spring. Sept.–Nov.	Year.
	°	°	°	°	°
Sandhurst ...	54·9	52·7	42·7	49·4	49·9
Melbourne ...	51·4	50·8	41·0	45·7	47·2
Beechworth ...	...	51·1	38·5	46·7	...
Ballarat ...	47·8	45·8	36·4	41·4	42·8
Cape Otway ...	55·7	54·2	45·9	50·6	51·6
Portland ...	60·1	57·4	49·2	53·3	55·0

Mean relative Humidity at different Stations for every Month and for the Year 1874.

Months.	Sandhurst.	Melbourne.	Beechworth.	Ballarat.	Cape Otway.	Portland.
January ...	0·60	0·67	0·76	0·54	0·90	0·75
February ...	0·57	0·61	0·56	0·56	0·80	0·75
March... ...	0·76	0·75	0·80	0·65	0·91	0·81
April	0·77	0·78	0·81	0·67	0·92	0·80
May	0·86	0·81	0·86	0·74	0·90	0·80
June	0·87	0·79	0·86	0·71	0·86	0·82
July	0·84	0·81	0·89	0·76	0·89	0·82
August ...	0·85	0·75	0·83	0·70	0·87	0·79
September ...	0·78	0·73	0·80	0·67	0·85	0·81
October ...	0·76	0·68	0·75	0·57	0·94	0·76
November ...	0·70	0·65	0·66	0·60	0·94	0·75
December ...	0·69	0·65	0·57	0·66	0·96	0·76
Year	0·75	0·72	0·76	0·65	0·89	0·78

Mean relative Humidity at different Stations for the Four Seasons and for the Year 1874.

Stations.	Summer. Dec.–Feb.	Autumn. March–May.	Winter. June–August.	Spring. Sept.–Nov.	Year.
Sandhurst ...	0·57	0·80	0·85	0·75	0·74
Melbourne ...	0·62	0·78	0·78	0·69	0·72
Beechworth ...	...	0·82	0·86	0·74	...
Ballarat ...	0·51	0·69	0·72	0·61	0·63
Cape Otway ...	0·85	0·91	0·87	0·91	0·89
Portland ...	0·75	0·80	0·81	0·77	0·78

Amount of Rainfall at different Stations for every Month and for the Year 1874.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Ararat	2·23	0·30	6·30	1·03	1·47	1·24	1·34	2·29	2·66	1·62	0·98	1·70	23·16
Ballarat	1·04	0·14	7·28	1·59	2·95	1·64	1·70	2·52	3·29	2·07	1·60	2·01	27·83
Beechworth	4·89	0·56	4·83	2·86	5·45	4·96	3·49	2·67	4·22	1·17	0·41	0·61	36·12
Berwick	3·12	1·54	7·17	2·49	3·91	4·76	2·37	3·62	3·05	3·13	2·99	4·12	42·27
Birregurra	5·34	1·74	5·05	1·65	2·91	3·33	2·64	4·41	6·01	3·12	2·97	3·98	43·15
Buninyong	1·04	0·46	7·73	1·85	3·27	1·46	1·88	2·76	3·98	..	..	..	..
Camperdown	2·80	0·77	4·95	0·75	4·05	2·61	4·17	3·10	4·22	3·08	2·35	3·60	36·45
Cape Otway	3·90	1·84	4·05	2·87	4·02	3·76	3·85	5·21	5·18	2·05	2·54	3·17	42·44
Daylesford	5·34	0·19	6·44	3·90	3·00	2·48	2·18	2·97	3·59	2·75	1·18	1·94	35·96
Ferntree Gully ..	..	..	7·87	2·50	5·42	4·91	2·75	4·42	3·75	3·62	4·13	3·52	..
Geelong	1·95	0·64	3·74	1·43	1·68	1·26	0·93	1·83	3·09	1·69	1·50	1·30	21·04
Hall's Gap, Grampians	..	..	..	..	..	..	4·46	4·09	5·99	2·12	1·41	1·63	..
Harrow	..	..	..	..	..	..	3·04	3·10	2·92	1·54	0·75	..	..
Hamilton	0·59	0·77	3·20	1·32	1·55	1·74	1·90	2·49	3·61	2·24	0·88	2·26	22·55
Hastings	2·05	1·29	6·58	3·24	4·54	5·58	2·79	4·83	4 84	3 19	2·58	2·51	44·02
Horsham	2·39	0·03	3·99	0·69	1·23	1·82	1·60	2·02	2·61	1·50	0·67	0·93	19·48
Kew	3·07	1·19	6 16	2·66	2·45	2·02	2·36	1·88	2·57	3·65	2·29	2·16	32·46
Kingston	2·21	0·19	8·01	1·68	3·50	2·32	2·70	2·34	4·18	1·46	1·49	1·55	31·63
Kyneton	5·52	0·41	4·81	3·66	2·37	3·45	3·40	3·39	3·17	2·31	1·39	0·82	34·10
Marong	..	0·25	8·31	1·78	3·48	5·87	3·02	4·88	6·36	4·93	1·64	2·58	..
Melbourne	2·14	0·88	6·36	1·71	2·07	1·45	1·86	1·95	2·84	2·80	2·12	1·92	28·10
Mount Macedon ..	2·88	0·47	8·03	3·29	3·03	3·10	3·25	4·31	5·26	3·50	2·07	2·32	41·51
Plangil	5·01	0	3·01	3·61	1·15	1·92	1·03	0·65	1·20	0·41	0·58	0·06	18·63
Port Albert	1·67	0·92	5·67	1·58	1·42	2·16	1·98	1·93	3·28	2·74	2·20	1·53	27·08
Portland	1·75	1·76	1·72	2·12	3·03	2·64	4·27	4·44	4·69	1·40	1·72	2·57	32·11
Rokewood	1·82	0·68	5·90	0·83	1·86	0·83	1·33	2·03	2·73	2·96	1 02	2·03	24·02
Sale	4·50	2·00	5·49	0·42	2·57	1·54	1·75	1·30	3·80	1·15	4·05	2·20	30·77
Sandhurst	3·77	0·02	3·14	1·91	1·76	1·62	1·89	1·11	1·72	1·19	0·65	0·80	19·58
Schnapper Point ..	2·21	0·84	7·14	3·28	4·10	4·08	1·65	3·86	4·08	2·81	2·81	2·11	38·97
Stawell	1·10	..	5·25	0·71	1·48	1·55	1·94	1·76	2·40	1·17	0·88	1·39	..
Wahgunyah	5·13	0·29	4·57	0·82	3·41	2·79	1·67	1·25	3·32	2·30	0	0	25·55
Warrandyte	3·61	0·81	8·41	2·09	3·59	3·73	2·55	4·13	3·32	3·07	3·12	2·54	41·00
Wyndham	..	..	..	..	..	..	1·04	1·40	2·63	2·14	1·63	1·76	..

RAINFALL AT DIFFERENT STATIONS FOR THE FOUR SEASONS, ARRANGED IN THE ORDER OF "GREATEST YEARLY RAINFALL" FOR 1874, BEGINNING WITH THE 1ST OF DECEMBER 1873 AND ENDING WITH THE 30TH OF NOVEMBER 1874.

Names of Stations.	Summer. Dec.–Feb.	Autumn. March–May.	Winter. June–August.	Spring. Sept.–Nov.	Year.
	inches.	inches.	inches.	inches.	inches.
Hastings	4·48	14·36	13·20	10·61	42·65
Cape Otway	7·33	10·94	12·82	9·77	40·86
Mount Macedon ...	4·01	14·35	10·66	10·83	39·85
Berwick	6·00	13·57	10·75	9·17	39·49
Warrandyte	5·11	14·09	10·41	9·51	39·12
Schnapper Point ...	4·43	14·52	9·59	9·70	38·24
Beechworth	7·26	13·14	11·12	5·80	37·32
Daylesford	6·67	13·34	7·63	7·52	35·16
Kyneton	6·81	10·24	10·24	6·87	34·16
Camperdown	4·01	9·75	9·88	9·65	33·29
Kingston	3·58	13·19	7·36	7·13	31·26
Kew	4·84	11·27	6·26	8·51	30·88
Portland	4·66	6·87	11·35	7·81	30·69
Sale	7·05	8·48	4·59	9·00	29·12
Melbourne	3·61	10·14	5·26	7·76	26·77
Ballarat	1·92	11·82	5·86	6·96	26·56
Wahgunyah	6·07	8·80	5·71	5·62	26·20
Port Albert	3·07	8·67	6·07	8·22	26·03
Rokewood	3·06	8·59	4·19	6·71	22·55
Ararat	2·68	8·80	4·87	5·26	21·61
Hamilton	2·02	6·07	6·13	6·73	20·95
Geelong	3·11	6·85	4·02	6·28	20·26
Sandhurst	4·29	6·81	4·62	3·56	19·28
Piangil (25 miles below Swan Hill)	5·69	7·77	3·60	2·19	19·25
Horsham	2·53	5·91	5·44	4·78	18·66
Stawell	...	7·44	5·25	4·45	...
Buninyong	2·32	12·85	6·10	...	...
Marong, Kangaroo Flat	...	13·57	13·77	12·93	...
Ferntree Gully, Dandenong Ranges	...	15·79	12·08	11·50	...

Dates of the occurrence of "Hot Winds" at different Stations.

At Melbourne	February 4th and 28th; December 28th.
Sandhurst	February 4th; October 11th and 12th; November 4th, 12th, and 21st; and December 4th, 17th, and 28th.
Portland	February 4th, October 11th, November 12th, and December 6th.
Port Albert, ...	October 11th.
Mount Macedon	February 14th, 27th, and 28th; October 10th, 11th, 13th, and 18th; November 4th and 8th; and December 4th, 16th, 17th, 22nd, and 28th.
Kingston	October 3rd, 11th, and 12th; November 12th; and December 4th and 28th.
Marong (Kangaroo Flat)	Exceedingly dry during the month of February, with hot winds.

Dates on which "Frost" occurred at different Stations.

At Melbourne	June 15th, 16th, and 27th; July 7th, 14th, 16th, 20th, 28th, 29th, and 30th; August 3rd, 4th, and 5th; and September 11th; with ice on June 15th, July 30th, and August 3rd, 4th, and 5th.
Portland	July 21st and August 4th.
Port Albert	June 16th and 17th; July 15th, 16th, 20th, 21st, 22nd, 28th, 29th, and 30th; and August 3rd and 5th.
Berwick	July 27th and 30th; August 3rd, 4th, and 5th; thick ice on August 3rd.
Warrandyte	July 13th, 14th, 15th, 16th, 21st, 22nd, 23rd, 24th, 27th, 28th, 29th, 30th, and 31st; never before this season experienced more than 3 consecutive days of frost without rain; August 3rd, 4th, and 5th, with ice indoors for two successive days; September 29th and 30th; October 1st.
Mount Macedon	June 1st, 2nd, 12th, 15th, 16th, and 27th; July 5th, 6th, 7th, 8th, 13th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 27th, 28th, 29th, 30th, and 31st; the sharpest frost of the season on the 28th; August 2nd, 3rd, 4th, 5th, 13th, 14th, and 16th; September 13th, 19th, 22nd, and 23rd; October 1st.
Kyneton	May 28th; June 2nd and 16th; July 16th, 19th, 20th, 21st, 22nd, 27th, 28th, and 30th; August 3rd, 4th, 5th, and 15th, with ice 1 inch thick on the 5th.

At Kingston	June 10th and 11th ; July 15th, 16th, 17th, 18th 19th, 20th, 21st, 27th, 28th, 29th, 30th, and 31st ; August 3rd, 4th, 5th, 6th, and 12th.
Daylesford	Sharp frosts during the last half of July.
Harrow	July 14th, 15th, 16th, 21st, and 29th ; August 1st, 2nd, 5th, 7th, 13th, 14th, and 16th.
Wahgunyah	June 24th.
Marong (Kangaroo Flat)	Very frosty during the latter part of July and first half of August ; very cold thoughout September, with frequent frosts.
Rokewood	August 3rd and 4th.
Wyndham	August 1st, 2nd, and 3rd, very severe.

Dates on which "Snow and Sleet" fell at different Stations.

At Mount Macedon	July 3rd and 5th ; ground covered with snow on the 7th and 8th ; heavy snowstorm on the 9th ; August 2nd ; September 6th, 7th, and 20th ; Mount Macedon covered with snow on the 6th ; November 27th snow and hail.
Ballarat	September 7th.
Beechworth	May 22nd ; July 9th ; snowstorm on August 30th ; September 6th and 7th.
Daylesford	August 30th ; September 6th, 7th, and 20th.
Kingston	July 6th and 9th ; August 2nd and 30th ; September 5th and 7th.
Kyneton	May 22nd ; August 30th ; September 7th and 20th.
Cape Otway	September 6th.

Dates of the occurrence of "Hailstorms" at different Stations.

At Sandhurst	March 5th.
Stawell	March 23rd ; May 19th.
Cape Otway	May 22nd ; July 9th ; August 18th, 29th, and 30th ; September 6th, 18th, and 27th ; October 31st.
Kyneton	May 19th ; August 2nd, 17th, 23rd, and 30th ; September 4th, 5th, 6th, 13th, 19th, and 20th ; October 25th ; and December 23rd.
Beechworth	July 9th ; September 6th ; October 19th.
Kingston	July 6th and 9th ; August 2nd, 17th, and 30th, with very large hailstones on the 17th ; September 7th ; December 23rd.
Rokewood	July 6th and 9th ; September 6th and 20th ; October 25th ; December 9th.
Portland	August 23rd, 24th, and 30th ; September 6th.

At Port Albert	August 30th ; September 6th and 7th ; October 31st.
Berwick	August 17th and 24th. On the 25th October, at 3.30 p.m., one of the most terrific and destructive thunderstorms ever experienced here passed over this place. It commenced with a heavy downpour of rain for about twenty minutes, and was followed by an almost deafening crash of hail that lasted for about five minutes, the hailstones being 1 inch in diameter by 2½ inches in length, cutting off the growing crops close to the ground, and covering the ground with the leaves of trees, and breaking between 300 and 400 panes of glass in the village of Berwick alone. This hail shower appears to have travelled in two parallel belts, each about half a mile wide and about three miles apart, in a true north to south direction. The farms lying between the belts suffered little or no injury from the storm. The amount of rain that fell in one hour was 1·30 inches. November 14th ; December 6th and 22nd.
Daylesford	August 17th, with hailstones 1¾ inches in circumference ; September 6th and 7th.
Mount Macedon	August 17th ; September 20th, 21st, and 28th ; November 27th ; and December 23rd.
Melbourne	July 9th ; September 15th and 19th ; and December 6th.
Ballarat	September 7th and 19th ; November 27th.
Geelong	September 21st and 22nd.

SHORTHORNS.*

By Mr. Joseph Riddell.

Mr. Chairman and Gentlemen,

In introducing my subject I may state that I have chosen it because, in my belief, it is one of the least known of any branch of husbandry, and because I thought I should the more readily receive the attention of my audience in attempting to give a brief history of those animals which have become valuable in every clime to which they have been introduced. In all parts of Europe, in America, and here, at the antipodes, they are adding wealth to the coffers of their owners. The almost incredible prices which have been realized by the sale of them in all parts of the world, the eagerness with which they are sought for, and the rate at which their value is increasing, are sufficient to attract the attention of all who are engaged in husbandry, if not to their cultivation, at least to any particular fact appertaining to their history. It must, indeed, be interesting to all who are connected with farming to know something of the breed of that animal which has realized £7,000 in America, £3,000 in England, and £1,500 in Australia. It is also of vital importance to the country we live in that free and open discussion should be held by this and all kindred societies, to determine as to the excellence of this or that race of cattle, and to ascertain by a liberal interchange of opinion and experience (which can only be had by such a gathering as the present) whether the Hereford, the Devon, or the Durham is the most useful and profitable to a farmer in Australia. It has already been decided in the old country that the shorthorn carries off the ribbon for all the good and useful qualities desirable in a horned beast; and it behoves us to ascertain whether this holds good in Victoria.

Many years ago a nobleman—the late Earl Spencer—said that "shorthorn" breeding was then only in its infancy, and that a great field would, in the course of time, open to recompense those who had used their energies and ability in improving the beeves of Great Britain. This prediction has, no doubt, been realized, for not only are they to be seen in the luxuriant pastures of England, Ireland, and Scotland, but in

* A paper read before the Romsey Farmers' Club on the 6th June 1874.

America, Australia—indeed, wherever civilisation exists, the shorthorn lives to adorn. The origin of the Durham breed of cattle is somewhat obscure. It is, however, probable—in truth, it may be considered as a proven fact—that the great merits of shorthorns became recognized at or about the same time as the Hereford and Devon—a date long prior to that which writers in the present century would lead us to suppose. It is now a breed quite distinct from all others, and no doubt it was created and kept distinct by the knowledge applied in accordance with nature's laws. But some have alleged, and a greater number have believed, that the shorthorn race of cattle is a modern one, and simply a cross between the Teeswater and the polled Scot. I venture to suggest the following as the probable reason for such a statement. Breeders of the other kinds of stock could not see the reason why the horn of the one should be neat and ornamental to the head, whilst that of the other should be as straight as a railway semaphore, and as long as the horns of an antelope. They then set to work to manufacture a reason why such a difference existed, and undoubtedly succeeded, for many now believe that owing to the cross—the one beast having horns and the other none—produced the animal of which I speak, and at which the wide world stands this day in admiration. His symmetrical beauty over all other horned cattle, his quality and mellowness of flesh, and his graceful, yet dignified movement, are, indeed, sufficient to distinguish him as belonging to a pure race. There was, however, an experiment made by Mr. Booth, of Warlaby (one of the family of the late Mr. T. Booth); and be it understood that it was only such, and made when the experimenter was in the zenith of his fame, and not when he required a particular race of cattle. It was this: He obtained a red polled Galloway Scot, and from her fourth generation, or, in other words, from her great-grand heifer by Prince George, one of his pure bulls, produced Wild Rose, a female which bore in great style some of the most notable characteristics of the shorthorn. This instance will alone prove that the Durham is as pure and as ancient as any breed extant, and that through such purity of ancient ancestry, his likeness of form, and every grandly moulded part, is imparted to his offspring, even though they may be descended from a Galloway Scot.

Stock breeding is a science which requires study, labor, and many years' devotion, to make it successful and reward him who chooses it as a profession. It requires to be dealt with earnestly, energetically, and with an enthusiastic desire to grapple with any imperfection or stain in the character of an animal; to remedy any apparent defect; and to assist Dame Nature in her willingness to beautify and improve one of

her gifts to man. In breeding, therefore, retrogression must be strictly guarded against in the selection of a sire. For it is the male which makes the desired improvement in a herd. It is, consequently, essential that the choice of a bull should be judiciously and carefully made—in short, that he should inherit the good and valuable qualities of a long line of ancestors—in order that his character, and, of course, that of his pure and dignified parentage, may be imparted to the herd in which he is required to improve. The progeny will be increased in value by strict attention to such a choice ; and if, as it is alleged to be a proven fact, that four crosses with pure bulls are sufficient to stamp the offspring with the appearance and some of the characteristics of a shorthorn, how necessary and beneficial it is to possess, and continue to possess, the highest strains of blood which it is possible to obtain. It is not uncommon, however, in this, as in, I dare say, other countries, to see improved cattle decline in excellence, and sink back to a level almost as low as that from which they were taken. The cause of this is negligence, in some instances penuriousness, and in others want of perseverance. I have seen, and perhaps many have likewise noticed, a praiseworthy and wise commencement made by some in augmenting the value and heightening the character of their herds by using a well-selected sire. They have even become enthusiastic for a time in their new possession ; but, alas ! for themselves, they have allowed the fire of progression to burn out, and suffered the place of the pure beast to be taken up by a mongrel, whose color might be accidentally good, or whose only pretension to the right of reigning among shorthorns was that he bore some aristocratic name, selected, no doubt, from *Burke's Peeraye.*

In perusing the history of the rise and progress of the Killerby, Studley, and Warlaby herds of shorthorns, by William Carr, for the purpose of gaining information and facts to assist me in my present task, I find that the author is quite in accord with me in reference to the retrograde step of the stockowner. He says :—

"Interesting traits of the maternal ancestry of the *parvenu* bull reappear in his progeny—the brindle, it may be, of Pat O'Flannaghan's Kerry, the black nose and horns of Sandy Macpherson's Kyloe, or the long legs and flat sides of Taffy Owen's Glamorgan. But though the farmer sees that he is rapidly losing all the ground he had gained, and that his stock has ceased to be sought after, he rarely admits the cause."

It is certainly "wondrous strange" that a large outlay should be made to procure an animal in order to make one step in the right direction, and then allow the advantage gained by the use of such an animal to

waste away. Yet in many instances such is the case; and were it not for the unceasing energies of men who have long since passed away—the Booths and the Bates of England, and their praiseworthy imitators, who are with us still in Victoria, McDougall and Morton—we should even at this day have beasts tottering about upon our pasture lands, devouring as much food as would keep twice the number, unprofitable to the farmer, and in every respect a thriftless race of cattle.

The first improver of longhorns was Robert Bakewell; it is to him we are indebted for the first attempt at improving the animals which fell to the lot of the brothers Charles and Robert Colling, and to bring them to a greater state of perfection. Contemporary with these eminent breeders, who, I may state, lived within a short distance of Darlington, in the north of England, was Mr. Thomas Booth, whose name is inseparable from the history of the shorthorn. As the late Robert Stephenson advanced into usefulness and made subservient to the will of man what Watt commenced, so did Booth improve upon the labors of Bakewell and the brothers Colling. About the year 1790, Mr. Thomas Booth commenced the task which has subsequently gained for him a world-wide fame, and given to the world those gigantic, yet symmetrical, masses of human food which have in late years reached such enormous prices in all countries to which they have been introduced. Long anterior to the exhibition of the Durham ox by Mr. Charles Colling, a race of cattle existed which was supposed to be indigenous to the valley of the Tees, and commonly known as the Teeswater breed of cattle. These shorthorns, for they were then considered as such, received improvement by the judicious selections and crosses made by a Mr. Maynard and others. The specimens of the then existing breed of cattle were wide backed, good handlers, and just what the shorthorn enthusiast of the present day would wish to select to form the nucleus of a profitable herd. Their defects, however, such as prominent hips, sparsely-fleshed shoulders, and short hind quarters, were such as to bring into requisition the long-matured judgment of Mr. Thomas Booth, who became possessed of some cows and heifers from the farm of Mr. Broader, of Fairholme, together with a bull, "Twin Brother to Ben," from his contemporaries, Messrs. Robert and Charles Colling. From these animals, the rudimentary stock of one of our early proprietors of shorthorns, have issued many valued and renowned tribes. From them, also, came the 30 animals for which Mr. Booth, shortly before his death, refused an offer of £15,000, and to them are we at the antipodes indebted for the profitable adornments to our pastures.

I must not, however, neglect to mention at this stage of my paper the name of another great benefactor, who has succeeded in creating for his particular line of shorthorns an admiration which is unmistakably increasing, and an amount of enthusiasm which at times seems blended with recklessness. Mr. Thomas Bates, of Kirklevington, was alike to his great contemporary, Mr. T. Booth, an observant of the advantages which would accrue from an improvement therein. In the descendants of his herd, offspring of the animals which he succeeded in perfecting in form and quality, we have, I may truly say, a distinct family of shorthorns. And without attempting to particularize the difference between the "Booths" and the "Bates," and with no wish to hold up the one as being superior to the other, I will merely remark that so near are they akin in their excellence and worth, that, in the old country, as in this, the possessors of them are first at this show, and at that, reminded of their near approach to each other in perfection of symmetry, color, and touch—or, in other words, they vie with each other so closely as prizetakers as to make it a difficult matter for me to decide which is the most favored, or whether the Warlaby or the Wetherby shorthorn of the present day should hold the pre-eminent place over the other. Purity of blood and all that the most fastidious breeder can require in a beast is in the one as in the other. Indeed, it was never intended by me to praise any particular race of cattle in this paper, but to speak of them, the Booth and the Bates, as the best, the most profitable and well adapted to the climate of the land we live in. As Southey wrote to Sir Walter Scott, "We have both got to the top of the hill by different paths, and meet there, not as rivals, but as friends, each rejoicing in the success of the other." In similar language might the possessor of the offspring of Booth's Pilot, and Windsor, Bracelet, and Lady Fragrant convey his goodwill to the present owners of Bates's Dukes and Duchesses. The pure stock of both families are valued and sought for, and even though they be increasing in numbers, the prices which they have realized at recent sales must be a convincing proof that they are advancing in popularity and worth. At a sale held not long ago in America, 93 cows and heifers realized £73,700 16s., making an average of £791 8s. ; 16 bulls and calves made £6,460 13s.; and with a total of £80,061 9s. for 109 animals, we cannot but admit that "blood will tell." And notwithstanding the many controversies and differences of opinion as to the superiority of the Booth or the Bates, let me have a pure beast from either tribe, or from a blending of both these pure tribes, and I shall be assured that I have the nucleus of a grand and valuable herd. Branching out as they do from one stem, the great Comet, and vying

with each other so closely in the public's estimation, I cannot reason why the one strain should be held up as the paragon of excellence above the other, nor do I believe that the character of either is exalted by any puffing or other kind of advertisement.

Having thus attempted to give a brief history of shorthorns in England, let me ask your permission to give a short outline of their introduction and cultivation in Australia, before I proceed to say a little upon what a shorthorn should be. About the year 1822, Captain Hare brought out the first shipment of shorthorns for the Circular Head Company, Tasmania, and to them belongs the credit of introducing that breed of cattle to the southern hemisphere. The name of that company appears in the pedigrees of many noted animals at the present day, and to them one of our greatest breeders—Mr. Robert McDougall—is largely indebted for his now valuable, and, in some respects, unrivalled herd. Their importations were very large, and, perhaps, too extensive for the then young and sparsely populated colony. The demands for such high-priced cattle were meagre, and although, no doubt, their endeavors and stock were both appreciated, the sale of the progeny of such pure animals was not sufficiently large to recoup the company for the spirited outlay they made in Yorkshire, and hence the reason of the unsuccessfulness of the praiseworthy attempt to form an establishment wherefrom the settler might purchase not only well-bred cattle, but sheep, and everything requisite for his use in farming. At the sale of the company's property and stock, many of their choicest females were purchased to form their future home in Victoria, and to give birth to animals which have made fortunes for their owners. The proprietor of a herd which takes its descent almost entirely from the Tasmanian Company, and from English bulls, was, not long ago, offered £40,000 by a plucky New South Welshman to hand over his right, title, and interest to his two estates of 1,400 or 1,500 acres and shorthorn herd, which at the time consisted of not more than 160 or 170 head.

The credit which is attachable to Booth and Bates in England is similarly belonging to McDougall and Morton in Australia. They have improved, and almost remodelled, the Durham in Victoria. When we look back to the brindles and the crooked shaped brutes of twenty years ago, whilst visiting the herds depastured on the Skelsmerg and Arundel estates, we at once acknowledge our indebtedness to those who have successfully striven through so many years to grow animals which carry an abundance of mellow flesh, in lieu of the mean, tottering, despicable beast, with a hide as hard as a cricket ball, and with a small amount of poor meat underneath.

Besides the Circular Head Company of Tasmania, there were other early breeders in this colony, whom I must not omit to mention in my category. Messrs. Gardiner and Fletcher, of the Yarra Flats; Mr. Manifold, of the Western District; and Mr. Lyall, of Western Port, were all large contributors to the improvement of the bovine race in this hemisphere. From their stock, as well as from the Tasmanian herd, the first selections were made by our now famous breeders. But the cycle of time has left but few, if any, of the rudimentary shorthorns to distinguish what progress can be made in stock breeding by judicious selections and crosses. Be it not understood, however, that the famous shorthorns of the present day owe their descent wholly to such cattle as existed twenty years ago. By numerous and expensive importations, both of males and females, Mr. Robert McDougall, and Messrs. Morton Brothers and Leitch, have succeeded in establishing herds from which the most fastidious can choose. I may, I think, say with truth that Mr. McDougall was the first breeder of shorthorns in these colonies. There were others contemporary with him, and some anterior to him, but none seemed to work with so much enthusiasm, care, and judgment in the improvement of the stock which he could then gather together. And with his imported bulls, such as Van Amburgh, Lord Nelson, Dundas, Fusileer, the Regal Koodoo, and others of more recent date, he has perfected what his predecessors essayed to do. He was, indeed, regarded as the only owner of reliable blood in Victoria, and became invincible in the show-yards with both males and females.

Some years after Mr. McDougall first turned his attention to shorthorns, the firm of Messrs. Morton Brothers and Leitch imported the bull Lord Raglan and their cows Jessamine and Rosa, and with selections from colonial breeds they formed the handsome herd which about twelve years ago grazed upon the pasture lands of Mount Aitken. The dispersion of that herd, however, was considered necessary, in order that a more fashionable strain should beautify the gentle slopes of Mount Derrimut—one of the homes of the Bates breed of cattle in Australia. And with the imported cows Matilda, April Flower, Lady Flora, White Sommerton, and those which I have already mentioned, together with the bulls Royal Butterfly the 6th, the Duke of Brunswick, Oxford Cherry Duke, and the Earl of Geneva, the present owner, and one of the late firm, Mr. Richard Morton, has become one of the most successful breeders in the southern hemisphere. Indeed, the prices which he has of late realized for some of his admired animals, both in this colony and in New South Wales, would almost induce us to believe that the

day is not far distant when the shorthorns of Victoria will be considered good enough for exportation, and when their value will equal that of the Second Duke of Oneida, the Tenth Duchess of Geneva, whose respective prices were 2,400 and 7,000 guineas.

Since the year 1840, when Captain McKenzie imported a white bull of a respectable lineage to the King Parrot station, to the present day, the improvement of stock throughout Australia has been gradually, but surely, on the increase; and whatever might have been the character of Old Remus in Yorkshire, a bull used by the Circular Head Company of Tasmania, it is evident that his progeny of female descendants have assisted in a great degree to form for us the nucleus of some of the pure herds which we possess in Victoria. Some time after Captain McKenzie imported his first sire and cow, he bought five cows from the Tasmanian Company, and after his death the increase was mustered, and the best pen of two-year-old heifers was bought by Mr. R. McDougall, who has by a number of judicious crosses made those pedigrees which are traceable to the efforts of Captain McKenzie as valuable as any he can give.

It has been by unceasing and assiduous attention to the use of pure males upon cows which were stamped with the true shorthorn character that our breeders have made for themselves herds which would bear a creditable comparison with some in Great Britain. Indeed, some importations which I have seen are, in my opinion, nothing more than dealers' trash, and unworthy to be admitted among the improved stock of this colony, and most assuredly not worth the cost of freight from England to these shores. The alloy strain was not only palpably noticeable in their pedigrees, but in their appearance; and though they bore the aristocratic name of Duke This or Prince That, the bad blood which was infused by some detrimental cross or crosses would again spring up, phœnix-like, in their offspring. The pure herds of the colony, or those which are calculated to possess the greatest quantity of the best blood—for there are few cattle this day in existence that can be truly called unalloyed shorthorns—are, in my opinion, equal in many respects to those in the mother country. Not having been so much pampered and spoon-fed, Australian stock are healthier, and of a more robust constitution, than those in Britain, and their ancestry being in many instances without a stain makes them even preferable to those imported; and having the living great grandams and dams of some of our most celebrated families to look upon when choosing a sire, it is undoubtedly more satisfactory, and, I will add, more prudent, "to bear the ills we have, than fly to others which we know not of."

I have used bulls from the herds of Messrs. Morton Brothers and Leitch and Mr. Robert McDougall, and by them I have found the improvement which I desired; and would only wish to have the opportunity meted out to me by a life of a few more years to prove that by the use of their animals in such herds as mine, I could, in every way, produce animals inheriting more of the good and valuable qualities of the Durham than by using a dealer's selection, or, in other words, by propagating the alloy strains of the lane-side bull of England.

Now that we have taken a bird's-eye view of the shorthorn in the old country and in this, permit me to attempt to define what an animal of that breed should be, not only in appearance, but in the handling or touch. The latter I consider to be the most difficult part of the duties of a judge in a show-yard to determine upon correctly; and it is, no doubt, one of the most important, for it is certainly the index to quality. But notwithstanding that it is of such paramount importance, I have attended shows, and eagerly eyed the judges pretending to perform the functions of their office, but have ofttimes failed to see a hand of one of them placed upon a beast, and surely the outside form is not sufficient to denote mellowness and quality. It requires the feel of the hide and hair, and the manner in which the underneath mass floats when touched, in order to decide whether an animal handles well or not. Judging by points is, no doubt, the only way by which an accurate and satisfactory award can be made. By that means no suspicion can exist in the breast of the exhibitor that he is not receiving fair play, and there can be no danger of the partial man misleading his weaker colleague. Besides, there are some who would do their honest best in dealing out the prizes honestly and justly in each particular section; but for some trifling cause, perhaps the flurry of the moment, he neglects to draw a comparison between that shoulder and this shoulder, that barrel and this barrel, and when the scrutiny of the public—that never-failing best judge—scans the neat cattle class, the imperfection of the one and the superiority of the other is at once observed.

The acme of excellence in a show beast can the most readily and truly be discovered by measurement, and by allowing so many points for the head and horn, a less number for the flank, and so on, until every part of the animal has been examined, its value compared with other parts, and its real worth allowed for. The head is, in my estimation, of the greatest importance, and should receive the first attention. It should be broad across the brows, tapering towards the nose, with a full, noble expression of countenance, and a docile, yet firm, appearance.

The eye should be bright, full, and open. The chin should have plenty of loose skin hanging under it. The brow should not be pipe-like and small in circumference, but thick at the base, strong, and tapering gradually to the point. What some would call a neat little horn I would despise as indicative of a weakly consitution, and certainly reject the animal to which it belonged; but I would likewise condemn the one resembling a porter bottle as well, and would most assuredly ask to have a reformed horn—a horn less lusty than that which gave to the animal of yore the name of the longhorn. There is nothing, I think, so far estranged from reason as to say that a bull with a long, lusty, and what I should term a coarse horn, would beget females with a "feminine mien and character," and that the growth of their horns would not be influenced by the use of such a sire. If like begets like, which in the majority of instances it undoubtedly does, then give me a head ornamented with a horn thick at the butt, tapering to the point, evenly bent towards the brow, with a clean, waxy appearance, not round, but flat, and in every respect pleasing, as if nature had set it there as part of her handiwork to decorate the beast which she had in every other part made so handsome. I am not a believer in long, lusty horns, nor do I consider them compatible with what the Durham should be.

Having thus essayed to put forth my humble opinion upon what I deem to be the most important part of an animal, I will quote from a paper read before an agricultural meeting at Newcastle upon Tyne, by a Mr. Hedley, who, I may state, is considered to be one of the greatest authorities on stock breeding and shorthorns in the world. He says:—

"The head of any of our bovine race ought to have the first consideration; that is the true index to the vital acumen, and even bodily construction, and will be found to foreshadow all of good or bad that may be accomplished. Thus an animal possessed of a broad, full, spacious skull, and strong, evenly-bent, deflective horns, will be found to have a thick neck at the base, wide throat, and strong, nervous system; while one with long, narrow, contracted skull, and puny, abruptly-bent horns will be characterized by weakness, wildness, and slowness to fatten; a small, dull, sunken eye betokens hardness of touch and inaptitude to fatten; and a bright, large, open, soft eye *vice versa*; a starting, dark, fiery eye often accompanies a small forehead and hereditary wildness, and when combined with small, drooping horns, and a chin with no loose skin hanging from it, is a very despicable animal indeed, weak in constitution, predisposed to lung disease, and sterile in fattening propensities. * * * Animals with makely-formed heads have always small appetites, often narrow shoulders, and small loins, and the width of these parts will always be found in an exact ratio with the strength of the head. The nose, instead of being long and fine, as Virgil, Aristotle, and several other naturalists recommended, ought to be, in my opinion, thick, strong, and near the ear

as possible, if only in proportion to the size of the frame. Thickness of nose and thickness of chest are often twins, and so are thin, meagre, irregular noses, and consumption. Small snipy noses oft snift the air into frames of small capacities, and are joined to mouths that can crop but very small morsels at a time."

Such, then, are the observations of Mr. Hedley, one of our best authorities on the points of the shorthorn.

We shall now proceed to the neck, which, at its junction with the head, should be fine and clean, but gradually swell in size as it approaches and blends with the shoulders and breast. The shoulder points, by such a development of the neck, will appear to be hidden, and covered all over with a thick coating of flesh. The shoulder blades should have an obliquity, or incline backwards, in order to promote a levelness on the back, as well as to give the animal the power of travelling easily and gracefully. The crops should be broad and circular, with a good girth, prominent barrel-shaped fore rib, giving ample space for the lungs to perform their functions in; a broad, massive-shaped back, the forelegs wide apart, the space between the crops and the shoulder blades well filled in, the bosom projecting out massively beyond the legs, a grandly arched rib, covered with a substantial layer of flesh; broad, firm, and symmetrical hindquarters; a long, full thigh, with a thick, heavy, and robust twist; a soft, mossy coat, with plenty of hair, and a hide not too papery, which is a sure sign of a weak constitution, but mellow to the feel, flexible, and substantial. A beast of such a description as this is, in my opinion, what a shorthorn should be; and in order to support such an opinion, I shall quote from a letter signed "Melibœus," which appeared some time ago in an English journal:—

"The invariably strong, deep loin; round, prominent fore rib; barrel-shaped crops; large girth; deep, heavy flank, and almost perpendicular fore flank; the long, level, side line below the ribs, from flank to hockoter, or elbow; the straight underline of the belly, the full thigh, descending low down, and the twist abundantly developed; the back, straight in profile, wide and flat upon the top, and padded thickly with fine, lean flesh; the quarters long, level, and well packed; and the bosom grandly built out, massive and symmetrical, with shoulder points buried in flesh; the short, fine-boned legs, waxy horn, and thick, mossy hair, are, in my estimation, the true characteristics of a shorthorn."

Mr. Douglas also observed, in a speech at the dinner given in his honor at Hadddington:—

"It is not animals of a large scale that are wanted. In such subjects there is generally a preponderance of bone, long back, weak loins, flat ribs, and much coarse beef; what we want, in my opinion, is an animal of apparently small scale—but, in reality, not so—having a great propensity to fatten; on short legs, with fine bone, massive compact body, wide chest, ribs well sprung, thick loins, and

well-filled-up quarter, with deep twist, body all equally covered over with heavy flesh, and plenty of soft hair, and having no coarse beef on any part. This is my standard of a shorthorn."

And such a standard is undoubtedly the one we should have in our mind's eye, when a number of animals are placed before us in the show-ring, or in the fields of the breeder, to select from. It is, however, highly essential, as I have already stated, to know that a beast is "right come;" for, notwithstanding his being possessed of all the good points and indispensable qualities delineated in the foregoing, without a character, as in the human race, he is damned in the eyes of the prudent and practical breeder; and the progeny will fail to inherit the alluring outward show of the sire. There are some animals possessing lengthy pedigrees, which are, no doubt, spiced here and there with a valuable strain; but when the names of the descendants of the alloy family once appear in it, it becomes lessened in worth, and the beast to which such relationship belongs is invariably distrusted. Much difficulty is experienced by the uninitiated in detecting the good and the bad progenitors in the pedigree of a shorthorn; indeed, in many instances, it cannot be done, and, but for the taint, the sooty nose, the languid, drooping gait, and the inflexible hide, appearing in the offspring, the corrupt genealogy of the sire would remain unknown. Mr. Thomas Bates, in the history of improved Durham cattle, or shorthorns, and of the Kirklevington herd, says:—

"The value of pedigree depends not upon the length of such pedigree, but on the length of time there had been a succession of the best blood, without any inferior blood intervening in such succession. This can only be known by those who have known all the various crosses there are in any animal, and the blood or breeding of such from their own knowledge of the tribes from which they came, and how that produce bred again. There, even, the greatest judgment is required, which nothing but a long experience can give; and, in the present day, there are few indeed who can give that proper information which is requisite to decide with accuracy in all cases."

Humble parents, with a small and distant relationship to the pure tribe of shorthorns, will accidentally, at times, produce a noble-looking beast, with all the grandeur of symmetry and style possessed by the purest Bates or Booth; but the succession will be wanting, and possess an inferiority in appearance and quality to one or both parents. "A good beast must be a good beast, however he has come; but it is to pedigree alone that we can trust for succession."

Having given a brief history of the shorthorn in England and Australia, and having presumed to describe what he should be when at the acme of perfection, it behoves us to proceed to discover his uses,

and question his superiority over other breeds of the bovine race; and in doing so I will be as concise as possible, so that your time may not be needlessly occupied, and so that the subject matter for discussion may be the more lucid and clear. It is universally believed that the shorthorn is not satisfactorily productive for the dairy, and that the breed is only useful for its large and quick growth of fine-grained beef, for its early maturity, and its much prized docility.

Without any wish to appear as an authority, or to presume to have the right of setting forth my opinion as conclusive upon a question of such paramount importance, I will merely remark that, from my own experience, which has been gained by laboring in a dairy herd for a number of years, I consider the Durham, or shorthorn, of all kinds of horned cattle, to be the most profitable as a milker; inasmuch as I have found that not only does she supply milk liberally, but the quality of her milk is rich, and full of the butyraceous substances which are requisite in the production of good butter and fine cheese. There are milking families and beef-producing families; it is therefore essential for him who is desirous to improve his dairy herd, and retain in it its former milking qualities, to select a bull from a dam whose organization is full of all the properties of a dairy cow, and it is needless for me to say that such can be done in this colony as in England. Nature has infused the same powers into certain tribes of shorthorns in this hemisphere as she has in their native home; and with a greater constitutional vigor, which is, no doubt, created by the genial climate of Victoria, the pure cow should be as valuable in her production for the dairy as for the shambles. Mr. Bates has related many instances of females of the shorthorn race being great milkers, quick grazers, and growing to immense weights. Mr. Robert Colling, whose name is mentioned in the beginning of this paper, said, in 1804—"When I came to Brampton first, after the death of Mr. Harrison, my sister said that the milkmaid had repeatedly told her that one cow gave an extraordinary quantity of milk. After seeing this cow milked, it measured 26 quarts and a half." The next greatest quantity of milk Mr. Bates ever heard of a cow giving was 19 quarts and a half. Mr. Bates's first Duchess, by Daisy Bull, gave 14 quarts at each end of the day, and when churned, separately, made 21 ounces of butter per meal, or 294 ounces per week. This she did for some time in the summer, being pastured with 19 other cows, and getting no hand food whatever. Mr. Robert Colling's Bright Eyes gave 15 quarts of milk each time of milking. Daisy, cow by Favorite, 16 quarts; and the Match 'Em cow, the dam of the celebrated Oxford Premium cow, never gave less

than 12 quarts per meal when on grass. Satin, a pure Booth cow, when in the full flush of her milk, was wont to suckle two calves, and require milking dry after them. Caroline, of the same tribe, was also a prodigious milker, yielding, it is affirmed, when in the prime of her life, four average pailfuls of milk in the day. Campfollower, the dam of Booth's Commander-in-Chief, and, therefore, bearing close affinity to Field Marshal Booth, was as grand a dairy cow as she was a shorthorn. And Soldier's Daughter, the offspring of Lord of the Valley and Campfollower, is specially mentioned in *Bell's Weekly Messenger*, and quoted by Mr. Carr in his work on *Warlaby Shorthorns*:—

"We mention her," he says, "not so much on account of her merit, which is, however, of a distinguished order, as because it gives us an opportunity of stating, in reply to reiterated assertions to the contrary, that not only is the tribe to which she belongs, but that all the tribes composing the Warlaby herd, are famous for possessing more than ordinary milking powers."

I could go on to infinity in citing instances of the Durham cow being invaluable in the dairy; but without testing your endurance by such a procedure, I will merely assert that in all the different breeds of cattle there are good and bad milkers. The only guide we have in selecting a shorthorn, or any other description of cow, for milking purposes, is her form, and more especially the udder, which should be large, round, and full, with the milk veins protruding, yet thin-skinned, but not hanging loose or tending far behind. The teats should also stand square, all pointing out at equal distances, and of the same size; and although neither very large nor thick towards the udder, yet long and tapering to a point. A cow with a large head, a high backbone, a small udder and teats, and drawn up in the belly, will, beyond all doubt, be found a bad milker.

It is, perhaps, needless for me to comment largely on the fattening propensities of the shorthorn, for I think it is already admitted that of all kinds of cattle he is the quickest and most profuse in covering his carcass all over with beef—beef fine-grained and marble-like, and unlike the stringy stuff which, when cooked and partaken of, hangs like fiddle-strings between the teeth, difficult to masticate, and certainly unfit food for the aged and debilitated. Mr. Curwen, of Workington Hall, Cumberland, one of the most successful improvers of stock in the north of England, made several fattening experiments. His experimental cattle consisted of a pair of shorthorns, Herefords, Glamorgans, Galloways, longhorns, and a solitary Sussex. The greatest profit was £8 10s. 1d., on shorthorn No. 2, which increased in weight from 90 st. to 115 st.; and the second best was £6 15s., on a Hereford, which began at

61 st. 7 lbs., and made 29 st. 7 lbs. The former cost 2s. 4d. less than the latter to fatten. This test, I think, will serve to prove that the Durham has no parallel, under similar treatment, in feeding for the shambles, and I believe I may truly assert that he holds the superiority over all others of the bovine race in arriving at an early maturity, in grazing, and in growing to an immense weight. The Duke of Northumberland, a pure Bates bull, and for whom his owner refused an offer of 4,000 guineas, weighed before starting to show at Oxford, in the year 1839, the enormous weight of 180 st., or 2,524 lbs. He was then a three-year-old. We have, however, instances in this colony of animals of the *elite* breed weighing as much, and even outweighing their kinsman in the old country. Mr. Richard Morton's bull, who was exhibited and sold about twelve months ago in Sydney for the sum of £700, weighed 1,700 lbs. at two years old. Mr. Robert McDougall's Great Count, a twenty-four months old bull, bore down 2,000 lbs.; Grand Prince, a descendant of Prince of the Purple, when twenty-two months old, to the best of my belief, weighed 1,700 lbs.; Ajax Booth, at seventeen months and two weeks old, weighed 1,751 lbs.; and Grace McMaster, at four years old, who was fed entirely upon the natural pasture of the colony, when killed by Mr. Bennett, of Melbourne, weighed 1,240 lbs.

Comparing these weights with that of the Duke of York, of the Duchess tribe of shorthorns, who at twelve months three weeks old weighed 10 cwt. 7 lbs., we find that in this country, as in America, the Durham prospers and grows better in his youth than in his native home. The cause may be accounted for not only by the change of climate, but by the change of grasses; and although they may not be so succulent as in some of the rich meadows of old England, yet the desired improvement is made in all kinds of stock. An experienced breeder and highly scientific gentleman has remarked:—"Animals living year after year in the same place are eating themselves over and over again." Change of food and climate is undoubtedly requisite to produce good, wholesome blood, health, and a vigorous constitution; and when we have acquired such invaluable essentials as these in our improved stock, we may be confident that size of frame and beef will follow. If the removal be only from one field to an adjoining one, the herbage is slightly different, and the result will be as great in the beast as in the human being, who, from a slight change of diet—from a swarthy-colored plum pudding to a greasy fritter—becomes recruited, and may perchance feel the liver performing its functions less sluggishly than before.

It is, nevertheless, undesirable, and, in my opinion, attendant with bad results, to use a bull of too great a size. Moderate-sized males are in preference to the mammoth animals, whose proportions, like those of the Tichborne claimant, have lost all symmetry and beauty of mould. Gigantic sires, put to big-framed cows, are apt to produce plenty of bone, length of legs, prominent hips, a heavy, bony shoulder, and coarse, unsightly, projecting shoulder points. Whereas the compact, moderate-sized bull will be the means of begetting animals more perfect in shape, and in conformity with what a shorthorn should be.

Mr. Richard Booth's preference for a medium-sized sire is thus spoken of by Mr. Carr, of Stackhouse:—

"A great bull was in his (Mr. Booth's) opinion, a great evil—not only because large animals are generally wanting in that compactness and symmetry of form so essential in a sire, but because the size of the offspring being generally proportioned to that of the male parent, one of three things frequently results—either the fœtus fails to receive adequate nourishment from the dam for the support and increase of its growth and strength; or through lack of sufficient expansive power in the uterus, if not prematurely expelled, is warped in its proportions; or from the unsuitableness in size to the organs of the dam, the calving is attended with difficulty and danger, and the ligaments of the pelvic cavity, through which the calf must pass, are frequently lacerated, to the permanent injury of the dam."

In an article which appeared about eleven years ago in the *Mark-lane Express* occurred the following extracts from "Cline on the Form of Animals":—

"It has generally been supposed that the breed of animals is improved by the largest males. This opinion has done considerable mischief, and would have done more injury if it had not been contradicted by the desire of selecting animals of the best form and proportions, which are rarely to be met with in those of the largest size. When the male is much larger than the female, the offspring is generally of imperfect form."

It would, perhaps, be necessary for me to make some allusion to in-and-in breeding, but seeing the length to which I have already gone, I fear to proceed further, lest your patience give way; and that the tediousness of listening longer should provoke anything but a happy remembrance of the first paper read before the West Bourke Agricultural Society. I will merely remark, therefore, that although the wild cattle of Chillingham and Hamilton sprung from one cow and her bull calf, I would prefer the blending of one family with the members of some strange family, and the mixing of different bloods, in order to produce quality, constitutional vigor, and symmetrical proportions. And I certainly think that not only health is promoted by crossing one animal with another of different blood, but that the laws of nature,

whose limits cannot be passed without risking a bad result, are more strictly adhered to. "What is good in moderation is invariably bad in excess;" and though the good-looking sire and dam may be considered to possess all the necessary attributes to propagate their likeness to their progeny by in-and-in breeding, yet by some hidden quality they may stamp the whole of their offspring with prejudicial developments.

In conclusion, in no department of agriculture are the results of assiduous care and attention so strongly and palpably marked as in the noble and dignified figure of a shorthorn cow or bull; and in no branch of husbandry can be found a bank equal to that of breeding improved stock. The many recent sales held in this country, in Great Britain, and in America, should serve to encourage those who have already begun to alter the character of their herds to go a little further in the way of improvement. Let those who are engaged in pastoral pursuits, and who are still clinging to the system of breeding unprofitable cattle, but glance at the prices realized by the sale of pure stock at Colac, and I think they will receive a sufficient impetus to reform their mode of utilizing the pastures which they possess, and become the breeders of shorthorns.

Discussion.*

Mr. Gibson would be exceedingly sorry to see a paper of such excellence as that which had been read by Mr. Riddell to pass over without a discussion. There was only one part of the paper to which he desired to refer at present, and that was the milking qualities which Mr. Riddell claimed for the shorthorn. (The speaker here read the paragraph to which he took the exception.) Now in that paper Mr. Riddell gave a description of what the pure Durham should be. Mr. Riddell also gave it as the result of his experience that the shorthorn was the best milker, and certainly such experience was entitled to great weight and respect. But he believed that, as a rule, the shorthorn was not by any means the best milker. As a beef producer, he admitted the animal to be unsurpassed, and it was this particular faculty of quickly fattening that prevented the possession of great milking capacity. Mr. Riddell had certainly given instances of most extraordinary yields of milk, but he considered them the exception and not the rule. He contended that, as soon as an animal was selected for her milking qualities, the true type of what a shorthorn should be was departed from.

Mr. Wragge contended that by careful selection from milking families it was possible to get as good milkers amongst shorthorns as any other.

* Abridged from report in *Lancefield Examiner* of 9th July and 23rd July 1874.

In short, that the animal was the most profitable, not only on account of her excellent milking qualities, but also for the wonderful beef-producing qualities of the race.

Mr. HURST endorsed the views expressed by Mr. Gibson. The Durham was not celebrated as a great milker, but as a great beefer. He was certainly of opinion that for the dairy the Durhams were not by any means so profitable as the Ayrshire, the Devon, or the Alderney. The shorthorn milked well for two or three months, and then fell off, going into beef.

Mr. JOSIAH MITCHELL had heard the remarks of the gentlemen who had spoken. So far he had not heard anything to show that the shorthorn was not the best milker, as it was undoubtedly the best beef producer. London was entirely supplied from shorthorn cows, the "Lax" blood being especially celebrated for its great milking propensities. The Durham would give milk first and beef afterwards. He believed that, by judicious selection, both beef and milk, a greater quantity of both, could be got from the Durham than from any other race of cattle. This was marked by even a little admixture of shorthorn blood. He thought that Mr. Riddell might have made his paper more interesting if he had related his experience on the gradual introduction of the shorthorn blood to his herd. The speaker then related instances of good and bad milking results from crossing, the bad ones not having been selections from good milking strains. He referred to the necessity of breeding and feeding going hand-in-hand, to produce perfection in the shorthorn cattle race. He said that experience shows that generous feeding should go hand-in-hand with improved breeding. From the Brothers Collings downwards, all noted breeders have been liberal feeders. High cultivation is also necessary to produce and sustain improved vegetable forms. The reason of this seems plain. All improvements in both animals and plants are due to the natural law of variation. Changed conditions of life, and an abundant supply of nutritious food, tend to promote active variation. The slightest differences of form or organization are more or less hereditary, and transmitted by the parents to the progeny. Desirable variations are selected, perpetuated, and, as they appear, accumulated. In this way our finest breeds of animals and our most useful plants have been improved. In obedience to the natural law of variation, domesticated animals and cultivated plants assume—if he might use the expression—an exceedingly plastic condition, and become capable of being moulded and fashioned to serve the requirements or please the fancy of man. The improved shorthorn is a marvellous instance of the power of man to avail himself of the laws of nature for the benefit of his race. In

this breed of animal he has developed great fattening aptitude, and early maturity. Some persons affect to sneer at what they are pleased to term "coddling and spoon-feeding," but, call it what you will, it is to generous feeding, careful attention to natural comfort, combined with wise selection, that the improved shorthorn breed of cattle owes its existence. And it is only by strict attention to these conditions that the improvement achieved can be maintained. People may say that "herds have been wonderfully improved by the introduction of good blood alone, while feeding exclusively on grass." Granted. Of this he need not travel far to find an example. The inference to be drawn from such instances is that prior to the introduction of "good blood" good food had been allowed to find its way into bad hides. "Lean-fleshed, ill-favored kine" unfortunately did not die out with the house of Pharaoh. The pitiful sight of ill-doing, thriftless brutes grazing on rich pasture land is by far too common at the present time in this colony. The sooner such pastures are stocked with improved animals, to turn the feed to the most profitable account, the better will it be for the owners or occupiers. But what he wished to assert is this: When you have improved the stock on a farm, or in a district, either by selection, or by the more speedy method of introducing highly-bred sires—when you have succeeded in establishing a breed of cattle in harmony with the surrounding conditions of life, and capable of extracting and converting into rich juicy beef, in the shortest possible time, all the flesh-forming substances contained in the food consumed—then, before any further improvement can be made, the pasture must be improved, or the food supply in some other way increased or enriched. Blood alone, gentlemen, will not produce either beef, butter, or cheese, any more than the most improved winnowing-machine or corn-screen will add to the yield of grain; and it is because improved breeding involves generous feeding, and leads to improved cultivation, that he is fully persuaded it would prove highly conducive to the general interests of agriculture if every farmer would aim at keeping well-bred stock.

Mr. Riddell then rose and said:—A great deal has been said about feeding, and much has been done by it. It is, no doubt, indispensable for the successful introduction of cattle to the show-ring; but it is surely not an essential to improve the character of a shorthorn; nor is it wanted to retain purity, nor to disseminate that purity. High feeding may truly be considered a great evil; and in many cases it is attended with detrimental results. The female very often becomes barren, and the male has frequently been known to become denuded of the powers of procreation, and at length ended his short lifetime in the shambles.

The beast that is suffered to graze naturally in the spring and summer, with an addition of hay and mangolds in the winter, will be found to be more profitable than the one which is pampered, and whose constitution becomes weakened by the too free use of oilcake, and the processes of stuffing so ardently adhered to by the breeder. A scant supply of herbage, however, is likewise injurious, and should at all times be guarded against; and more especially when we are told by such an authority as Mr. Mitchell—a gentleman who has devoted a lifetime to the study of the proper management of the soil—that a pure shorthorn, if depastured on a place next door to starvation, will in the course of time almost lose the germ of his or her distinct breed, and retrograde into a semi-worthless state. However obnoxious poverty may be to man and beast, and no doubt it is so to both, I cannot hold the belief which is entertained, and so ably put forth, by Mr. Mitchell. I will, therefore, ask your permission to continue, not exactly in the same course as I did at the last meeting of the society, for then I considered it necessary to prove, before entering to discuss Mr. Mitchell's remarks, that the shorthorn is a pure breed of cattle, and not made up or created by "coddling and spoon-feeding." Mr. Mitchell would have us to believe that the shorthorn is nothing more than a wayside beast, improved by high feeding; and when that beast is moulded, fashioned, and improved, by the generous treatment meted out to him, no further improvement can be made until the pasture is improved, "or the food supply in some other way increased or enriched." "Blood alone," Mr. Mitchell says, "will not produce either beef, butter, or cheese." Granted. I will willingly admit that no animal can yield a profit, nor be of that use for which he or she is intended, nor even exist, without a proper supply of sustenance. But, gentlemen, it has yet to be proved to me that when no further improvement can be made in the pasturage or spoon-feeding, the animal at once stops his or her progress towards perfection. If purity of ancestry is inherited, the cow must, and will, by the use of a highly-bred sire—a sire properly selected, in order to blend the qualities possessed by himself with those of the female—produce in her offspring more commendable traits of character than those which are noticeable in herself, even though her food be in no way increased or enriched. Indeed, Mr. Mitchell himself is in accord with me when he says that "the slightest differences of form or organization are more or less hereditary, and transmitted by the parents to the progeny." If, as Mr. Mitchell states, in one part of his paper, this is the only requisite to preserve the germ and type of an animal, that animal will receive improvement by the judicious blending of a well-selected strain of blood, I am at a loss to

know why a cow, profusely fat, should have a greater power to improve her race than the cow in a healthy, grass-fed state. But in another part Mr. Mitchell asserts that "it is by coddling and spoon-feeding, natural comfort combined with wise selection, that the improved shorthorn breed of cattle owes its existence; and it is only by strict attention to these conditions that the improvement achieved can be maintained." What kind of improvement does Mr. Mitchell mean? If in flesh and quantities of fat, I can agree with him; but if in the form or organization, then I refer him to his own statement, which entirely disagrees with the coddling and spoon-feeding, said by him to be necessary, not only to maintain the improvement, but to create the breed of the shorthorn beast. If "the slightest differences of form or organization are more or less hereditary," and taking it for granted that such form is symmetrical, and that such organization is good, then surely it is not requisite that oilcake or any other cattle luxury should be used as an indispensable aid to maintain the improvement of that form or type of such animal. Let us suppose a pure shorthorn cow to be placed on some poor prairie land in America—or let us bring the picture a little nearer to us, and fancy we see a poor, lean, Duchess cow, with her calf by one of Colonel Gunter's Grand Dukes, grazing on the breast of Mount Macedon. Let us further suppose that such treatment is continued to the fifth or sixth generation, and that a male calf is the last production of that Duchess cow. I argue that such male animal, if taken from his poor and hungry haunts to rich and luxuriant pastures, and used as a sire, the offspring of the herd in which he is placed will inherit as much of the pure blood of the shorthorn as if he had been nurtured and fed in the most judicious and careful manner. I will not contend that the beauty and size of the badly-fed brute will bear comparison to his stall-fed kinsman; but I assert, from a sincere belief, that the germ of the particular breed will not even be lessened in the smallest degree by the beast being suffered to linger, generation after generation, upon poor pasture lands; that his character will be the same; and though the nobility be hidden in his lean, lank, carcass, and his very appearance be that of a mean, despicable commoner, depend upon it, his good qualities, inherited from "respectable parents," will gush out into the blood vessels of his offspring, to form and to nourish the development of the characteristics of the shorthorn. Breeding and high feeding need not go hand-in-hand to retain nature's endowment to the kind of cattle of which I speak; but I admit that it is requisite to feed extensively and expensively, if it be designed to show off the capabilities of this particular race; to promote growth of carcass, softness of hair, and mellowness of

flesh ; to furnish the animal with the outside adornments which place him above all other cattle in appearance, and to arouse the latent capabilities of his race. Why should not the wild cattle of Hamilton be not only materially changed in form, but different in color ? A century and a half ago they were white—they remain so now ; and notwithstanding their breed has been kept pure and distinct from all others, and though the pastures which they occupied were of the kind which would be calculated by some to create not only a great degeneracy in size and vigor, combined with in-and-in breeding, to literally stamp out of their bleached-like hides the very germ of a horned beast, they yet exist, and at the present day bear a favorable comparison to what they were a hundred years ago. The essential element for the preservation and propagation of purity is purity of ancestry. Nature in her own mysterious way builds up a protection against the intrusion of poverty upon the archetypal cast of even the brute beast, and likewise befits each minute molecule and smallest component part of which an animal consists, not only to the climate, but, in the course of time, to the herbage whereon the particular animal may be left to graze and to live. When once a diminution of size begins, and it inevitably will do upon poor pasture, nature is then commencing to protect intact the fount of the distinctive properties of the breed ; and if not the likeness, the type of such particular race of cattle will as distinctly show itself on a barren moor as in the place of comfort and luxuriance. The linking together of the "kith and kin" of the shorthorn, and the production of an unbroken strain of purity of the shorthorn, from generation to generation, owe not their indebtedness to oilcake and sugar, but to nature's laws. The primeval worth of a pure race of cattle will descend in a perfect state of preservation from one line of ancestry to another, and the dissemination of that blood into herds of lesser worth and purity will be as distinctly noticeable as the distinction between the shorthorn and the Hereford.

Having thus essayed to give my opinion why it is not necessary that breeding and high feeding should go hand-in-hand in order to retain the original cast of the shorthorn, I will now proceed to reply to those who assert that the cow of that breed is not valuable for the dairy. As I have already stated in my paper, there are milking families and beef-producing families in the Durham breed ; and I think I may safely say that no dairyman would choose a sire from a dam whose very appearance would denote that her progeny were best adapted for the butcher and not for the dairy. I have always taken the precaution, when buying my bulls, to make strict inquiries as to the milking qualifications of their dams,

and have on some occasions seen their production in the pail; and, Sir, without wishing to advertise my stock, I may state that nearly the whole of my cows are honest, good-tempered, and profitable. Such was not the case when I commenced as a dairyman. And, besides the liberal supply of milk, I will add that, from the tests which I have made, I have invariably found that the milk of the shorthorn contains more butyraceous matter than the milk of any other cow, and if we exist by butter-making or cheesemaking, the cream-producing qualities of Violet, Dairymaid, and Rose are indispensable, not only for profit, but for the production of a good saleable article. It is an admitted fact that there is no member of the bovine race so docile as the Durham. The female is always ready to part with the contents of her udder to the gentle hand of a kind and merciful being. But, as many around me are aware, it is not so with the hybrid beast; she will, at the least offence, "hold her milk," and suffer it to be drawn from her only by drops into the pail. This alone, I think, is sufficient to prove the superiority of the shorthorn over common cows in the milking yard. The "lean-fleshed, ill-favored kine"—they who outlived the house of Pharaoh—the ill-doing, thriftless brutes, who are atomies compared with that distinct race of cattle whose hides have ever been known to be mellow and flexible, and whose flesh-producing character has existed over three hundred years—are neither good for the shambles nor the dairy; for the brute who has not the power given to her by her particular breed to extract and convert into rich juicy beef, in the shortest possible time, all the flesh-forming substances contained in the food consumed, cannot, by any possible treatment on the part of her few friends and admirers, become valuable to the dairyman, inasmuch as she possesses not the attribute to sustain her strength and vigor whilst it is required of her to add her quota to the dairy; and, therefore, her milk will either be "sky-blue," or her bones will be almost protruding through her hide before she is permitted to go dry. My purest shorthorns are the best milkers, and would, with a few exceptions, continue yielding milk up to the time of calving. I, however, deem it necessary, for the purpose of allowing that resting time which seems to be required by nature, to suffer them to roam and graze at will for two months before calving. At the end of that time they are generally fit for the butcher, and certainly in better condition to produce milk than the cow which devours as much food, and returns to the milking yard unprepared to yield those butyraceous substances which are required in the manufacture of butter and cheese. It must be admitted, however, that not all shorthorns, nor the females of any other breed, can be entered in the category of good milch cows. Owing to

certain proclivities prevailing in particular shorthorn families, the disposition to fatten predominates over that of producing milk; but it is not the formation of the animal—the broad chest, the oblique shoulder, the barrel-like crops and ribs, the deep flank, nor the soft mossy coat of hair—that can be set down as the cause of such a disposition. There are, as I have previously stated, beef-producing families and milk-producing families; and if the two be kept distinct, each will inherit its distinct properties from generation to generation, and possess all the distinctions of form and character belonging to the shorthorn. Youatt, in page 239, remarks:—

"The practice of suckling the calf of the pure cow by adopting a foster-mother is no doubt injurious, and will, in the course of time, if adhered to at each calving, produce a prejudicial effect on the milk-producing organization of the dam. It is nevertheless a system followed by many breeders, and it may be truly considered as the chief cause of a number of pure cattle becoming almost useless as sucklers, or as milch cows."

Having given my own opinion and experiences of the shorthorn, I will mention the following observations made by Mr. Calvert, of Sandysike, near Brampton, on the quantity of butter yielded by one of his improved shorthorns:—

"The milk was kept and churned separately from that of the other stock, and the following is the account of the number of pounds of butter obtained in each week, for thirty-two weeks:—7, 10, 10, 12, 17, 13, 13, 13, 15, 16, 15, 12, 13, 13, 13, 14, 14, 13, 12, 12, 13, 11, 12, 10, 10, 8, 10, 9, 10, 7, 7, 7. From this it appears that there were churned 373 lbs. of butter in the space of thirty-two weeks. The cow gave twenty-eight quarts of milk per day for twenty weeks. She was lame during six weeks from 'foul in the feet,' which lessened the quantity of milk during that time. The pasture was by no means of a superior quality. * * * After such a record—and it is far from being a singular one—there can be no doubt of the possibility of raising a breed of milking shorthorns which will surpass every variety of cattle. We may, perhaps, safely add that we have that breed, and that it only requires a little care in the selection, and in crossing, to perpetuate it."—(Youatt, p. 247.)

Such, then, is my reply to the gentlemen who have had the kindness to open up a discussion upon my paper on shorthorns; and to whom I am indebted for having the opportunity afforded me of explaining that which I should have been more explicit upon on a former occasion.

FARM HOMESTEADS.*

By Mr. W. Anderson.

Mr. Anderson said:—The subject is one upon which much of the comfort of the agriculturist, his family, servants, and stock depends, and by the judicious arrangement of which much of the farmer's time—equivalent to his money—will be saved. In a paper such as the present, which was specified to be short, it will be impossible for me to do more than simply direct attention to the necessity which exists for something to be done to improve the arrangement of farm buildings in this district; and I certainly wish that a topic of such importance had fallen to some one better qualified than I am to deal with it. I think, however, that agriculture in all its branches will be shortly put on a proper footing.

I had the first report of the Secretary for Agriculture handed to me a short time since, and I am much mistaken if the gentleman chosen as secretary does not do something before long to disseminate useful information, not only on the cultivation of the soil, but also on the laying out of farms, the erection of homesteads, &c.; at all events, the portions of the work prepared by him are full of sound practical information. It will be admitted by all that in by-gone days the people of this district of the colony neither expended too much capital nor displayed very great skill in the arrangement of farm buildings. Several things tended to make it rather difficult, as the first consideration with most was to get shelter of some kind for the family; the second, clearing and cultivating, so that the land might be producing something for the support of the family and for its own further improvement. This is the natural consequence of settlement in a new country; many privations have to be endured, many makeshifts adopted, and especially is this the case where so many monarchs of the forest had to be dethroned as in this locality. That day has passed, however, and the farmer can look around him and see what next is to be done. The altered appearance of the district shows plainly that we have passed the first or clearing stage, and now paddocks are getting squared, and where one large paddock existed fences have been erected making it into two or three smaller ones, until

* A paper read before the Warrnambool Farmers' Club on the 24th July 1874.

I do not think many districts are far in advance of this in the matter of subdivision. But we are certainly lamentably in the background as far as homesteads are concerned. No doubt some have erected good substantial dwelling-houses, others have good out-buildings, but well-arranged farmsteads are as yet very scarce indeed. It is true that the same accommodation for housing stock during winter is not required here as in colder climes, and many seem to be under the impression that implements improve by being exposed to atmospheric influences ; at least no provision is made to protect them from the burning heat in summer or the soaking rains in winter ; it is, however, very short-sighted policy, not only involving the spoiling of the implement, but often vexatious delays occur just when the implement is required. How often does it happen that the exposure has loosened the tires of the dray wheels, which is not discovered until the load is on and half way to town? Then a hammering on with stones, or any other article procurable, takes place, or perhaps, if the driver is careless, off comes the tire, crash goes the wheel, and possibly a valuable horse is injured.

My subject naturally falls into three divisions, namely, the situation and aspect ; secondly, the buildings and their arrangement ; and, thirdly, the material of which they are constructed. It is desirable, in choosing a site upon which the steading is to be erected, to have it as central as possible. This, at first sight, does not seem a matter of much importance, especially when the method of farming hitherto in vogue is to be considered ; but when the passing of men and beasts to and from their labor in the field, the carting of the crop to the stack-yard, and the conveyance of manure to the various parts of the farm ; when the time occupied by all or any of these is calculated, it will be apparent that, other things being equal, a central position is the best. Little food, it is true, has as yet been carted on the land to supply our too often starving plants ; but I have no doubt many will begin to see, by and by, that they might as well expect good fat stock where little or no feed was to be found as a good crop from an exhausted soil ; and although a central situation may be the best, it does not follow that the farm buildings should be placed only in the centre. There are other things which demand attention. There is, for instance, the water supply. In this country few can plant their homesteads by the side of a running stream, but there are not many who cannot get water by sinking a reasonable depth where natural supply does not exist. Try first where a supply can be best procured artificially, for without a good supply of good water a farmstead is placed at a great disadvantage. There is one source of supply which, thanks to our proximity to the ocean, we can

avail ourselves of, and which has not been utilized as it might have been, namely, rain-water. From 30 to 37 inches of rain fall annually; all that is required is spouting to the buildings, a tank large enough to receive it, and an abundant supply of soft, good water can at all times be depended upon. Some argue that the farm buildings should be erected on low ground, because they are more snug and sheltered in winter, because water is more likely to be easily procured, and, further, because there is more carting to the buildings than from them. My opinion is that your buildings should be erected, where possible, on rising ground, as it is more likely to be dry, or at all events more readily drained. There is also this great advantage—the farmer is more likely to be able to see over a greater part of the farm, and will have the fresh breezes playing around. When practicable, the dwelling-house should face to the east, with the out-offices at the rear; but for the erection of a farm-steading no rule can be laid down, as so many things come into play to cause the farmer to erect his steading in opposition to the conditions mentioned. It is well to bear in mind three things in making choice of a site, namely, to have it central, to have it supplied with water, and to have it high and dry.

The next point to be considered, and which constitutes the second division of the subject, is the plan, and that, like the choice of a site, is a matter far too little considered by most farmers; in fact, the buildings are stuck here and there, rather to suit the caprice of the farmer than the requirements of the farm. In this country, where the materials used for buildings are frequently of a combustible character, and everything so dry as it is here in summer, it is not well to group farm buildings into too compact a space, so that if one portion caught fire the whole must perish. Still, there should be due regard had, and care exercised, to have them arranged so that ground and labor may be economized as much as possible; for instance, the implement-shed and the stable should be so situated as to cause the men little trouble in taking their carts or waggons out in the morning and putting them back at night. About the best arrangements for farm buildings is to have them forming a square, enclosing a good-sized yard. The farmer's dwelling, with the orchard, flower, and fruit gardens, should be placed at the east end, with the dwelling facing the east; the stable and hay-yard should be placed at the west side of the court-yard, the stable also facing the east. On the north side, and facing the south, should be placed the implement shed, and the dairy on the south, also the kitchen, store-room, dwellings for the men, and the milking-yard. Somewhere not far from the east end of the square should be the well, or tank. The barn and

stack-yard might be placed at some distance from the other buildings, as they will, in many cases, have to do double duty, in serving as a shearing-shed, and also as a storehouse for agricultural produce. So much for arrangement.

Of the dwelling-house for the farmer I will say nothing, as its size, &c., will depend more upon the farmer's position, and the necessities of his family, than the requirements of the farm. The rooms should be as large, lofty, and well ventilated as he can have them ; there should be no pools of stagnant water, no decaying vegetable matter or other filth lying about ; as, although this country has been hitherto comparatively free from epidemic disease, still cleanliness and neatness are indispensable to comfort and health. I should like to say a word or two about the stable. It should also be clean and well ventilated ; in fact, open stables, as they are called, appear to answer best for this country. I was at one period, when farming, much troubled with sickness among my horses, and was recommended to remove the front of the stable, and instead of keeping the horses so warm, turn them out at night, unless when very stormy indeed. From the time I adopted the plan not the least sign of disease or ill-health appeared among the horses. There is one plan in general use in the erection of stables which is, to my mind, very unsuitable for this country ; I refer to a loft for the storage of hay over the stable. It keeps the stable too close, unless it is an open one ; and if the floor is not very close, the dust keeps falling on to the horses. The hay, in hot weather, is as if baked in an oven ; and should the stable catch fire, it is almost impossible to get the horses out. A much better plan is to have the stable wide enough so that a portion might be portioned off for holding hay, and the racks supplied therefrom.

Having disposed of the horses, a word about the cattle. Hitherto, little has been done in the way of stall-feeding, although it is just possible that the day may come in Victoria when that would pay. Our very mild winter, however, saves the farmer from many of the anxieties, trials, troubles, and losses to which he is liable in colder climates ; in fact, all the housing for stock he requires here is a house for the bull, if he has a good one, warm quarters for the calves at night, and a good shed over the milking bails. Good warm quarters for the pigs can be readily placed at the rear of the implement-shed, which will afford not only a support for the roof but good shelter for the yards. Next to the stable should be erected the implement-shed, which ought to be sufficiently large to hold every implement used on the farm ; and having the shed, the farmer should see to it, that there is a place for everything

and everything in its place, and as accessible as possible; otherwise much valuable time will be lost looking for implements, or parts of them, which would be saved were they kept in their proper place. Not only are implements saved from injury by exposure when in a shed, but they can be cleaned, painted, or overhauled, even on a rainy day, which cannot be done if they are scattered about the premises, or left, as is often the case, where they were last used during one season until they are again required the next.

If dairying is carried on, the dairy should be erected not far from the dwelling-house. On many farms one of the rooms of the house is used for dairying purposes. There are many reasons, however, why this should not be. The dairy ought to be built of stone, brick, or pise, with a floor of material of a kindred sort; the roof should either be double, or have a plastered ceiling, as it is difficult to get the dairy sufficiently cool in summer. Having the dairy, it should not be used, as is too often the case, as a store-room, or receptacle for lumber, as milk is very easily spoiled if close to anything having a strong smell. Above all places, the dairy should be kept most scrupulously clean, and have an abundant supply of water. But I am descending more into detail than I intended. A word or two about materials, and I have done.

For the erection of the walls, stone or brick are by far the best, and where procurable, and where the farmer can afford it, they should be used by him, being safer from fire, more durable, cooler in summer, warmer in winter, and they can be insured at a much lower premium—advantages which are well worth a struggle on his part to obtain. Where the materials mentioned cannot be obtained, or the farmer cannot afford the extra cost, I would say, rather than spoil the buildings by having them too small, use timber, which will be found to last long if well attended to. The best covering for the roof is undoubtedly slates; they are, however, expensive; next to slates comes iron, to which there is only this objection—it renders the place covered with it excessively hot. Cut palings make a good and cheap roof, and after being on a few years, if they are covered with iron, make perhaps the best roof we can have here, next to slates. In conclusion, I would say to all, take time, and be careful in the choice of a site. Get a plan prepared, and if you cannot get the buildings erected at one time, build them as you can; but let every piece you build be in accordance with the plan, so that, when complete, each part will be in keeping with the other, and form a harmonious whole, suited to the requirements of the farm.

Discussion.*

Mr. J. W. Anderson said that circumstances altered cases, and that no two farm steadings were alike. Buildings were not required here so much as at home, and often there was not even shelter for working horses, while he hardly knew a cowshed in the district. Shelter, however, had a great deal to do with comfort as well as feeding. Farmers in this district had such an idea of farming for a time only and then taking land up country that they did not make improvements on a permanent scale. Dry seasons would bring back a great many to this district, and already there were increasing inquiries for farms here. In the face of a want of immigration, he couldn't blame the farmers for not putting in crops. Men were bribed to leave the colony by advantages held out to them elsewhere, and the colony was standing still for the want of a system of immigration such as that of New Zealand. Under such circumstances they could not expect farmers to put up permanent buildings. What was complained of was not big wages but low prices, owing to a want of population to eat the produce. He would like to see the farmers agitate the subject of immigration.

Mr. J. R. Evans mentioned recent contracts in which the rise in wages, combined with shorter hours, was equal to an increase of 25 per cent.

Mr. Wood said that if Mr. Anderson's paper had been contrary to people's views there would have been more in it to discuss. Certainly the farm steadings of the district were a good deal behind the times. As to stables being open, he thought that horses should not have long coats, and if they had light coats they wanted warm stables. With reference to stall-feeding cattle, he believed it would pay to fatten old cows or bullocks; but the accommodation for tenant farmers was very inadequate.

Mr. Evans thought stables could not be too airy, and they should have no hayloft.

The President said that there was very little to contradict in Mr. Anderson's paper. He went in thoroughly for open stables. When very close, they were apt to lead to inflammation, the biting wind going very keenly through a horse coming from a warm stable; he believed in an open front. As to sheds for young stock, warmth made growth as well as feeding; and he believed in belts of wood and shelter in any form for young stock. Stall-feeding cattle might come to pay, but an open shed in a yard was enough to put on flesh. He agreed with Mr.

* Reprinted from the *Warrnambool Standard* of the 25th August 1874.

Anderson that whatever a man does should be done systematically, whether in farming or building. If not, a farmer went haphazard, and might have to pay for it hereafter. It would be better to pay for a plan if a man had not the ideas in himself.

Mr. W. Anderson said he had purposely introduced some points on which there might be difference of opinion, such as the best position of a homestead on a farm, and he was sorry that no discussion had taken place on that subject. He held that a stable should not be draughty, but should have the whole broadside out of it, and should face the east. He found, when he had a close stable and the horses were bedded down in the old style, that several of them, after waiting three or four hours at the tramway, had been taken ill with inflammation: they were too tenderly nursed. The changes of climate in this colony were very rapid, and close-kept horses were unable to stand exposure.

THE GROWTH AND CONSUMPTION OF MANGEL WURTZEL.*

By Mr. W. Scott.

Mr. President and Gentlemen,

According to promise, I am prepared to give you my experience in mangel growing and consuming, but before doing so I wish to call your attention to the fact that this club during its existence has shown a too great desire for monthly papers, without taking time to discuss those read, thereby retaining the shell and dropping the kernel. Another thing we have not (but should have), a clause in our rules similar to that of the Highland and Agricultural Society of Scotland, and I think the Royal Society of England, viz., to prevent any one from reading a paper on any subject he had not practical experience of, or, in other words, had not done it himself. In consequence of this want, we have had some pure theoretical papers, which we should not have entertained. Any one considers himself competent to preach to a practical farmer, but it is only those that have studied the farmer animal that knows his aversion to being talked at by people ignorant of his business.

* A paper read before the Ballarat Farmers' Club on the 19th September 1874.

Although, I think, one of those theoretical papers deserves notice from us. I refer to the one on sheep-breeding in connection with tillage farms. This paper includes a little on sheep-breeding and the whole theory of farm practice from beginning to end. If the heads of this paper were pasted up in our meeting-room, they would afford subjects for discussion on farm practice for all time to come.

About mangels. At first glance, the heading of this paper will seem to have very little interest for a great many of my fellow farmers, and expressions will be dropped—What about mangels? What can he say about mangels? But any one driving through this country must have seen the many failures from people attempting to grow without previously preparing the soil for this valuable root, and if twenty years' experience in this district of a practical and successful grower is of any value, I freely give it; that is, it is no use trying to grow this crop successfully unless on land naturally drained (I refer you to our best banks of chocolate soil), or thoroughly artificially so, for they will not grow to pay on wet undrained land. I may be here told by some that they have grown them on wet undrained land. So have I; but what were they, and did you get a crop that paid you for your trouble once in five years, or once in ten? My experience is, once in twelve. A proper grown mangel, when thrown roughly against another in a heap, or against a hard substance, will crack and break. A mangel grown in wet spots eleven seasons out of twelve, in my case, was nothing but a tap-root; and in the twelfth, when they just paid expenses, they still partook of the tap-root quality. You could not break the largest of them, and the smallest would have made cricket balls. I see by the *Leader* newspaper of the 5th instant a description of an experiment tried in Ireland with mangel growing on two plots of land, I suppose of equal fertility, but they did not treat both alike. The report goes on to state the mangels sown in the one plot were not thinned out widely, but were allowed to grow rather close together; in the other they were supplied with a very large amount of manure—they do not say how much—and thinned out widely, so as to allow for the extensive development of the roots. The yield of the mangels that had been moderately manured and kept close together was at the rate of 46 tons 15 cwt. per Irish acre, the roots averaging 6 lbs. each; whilst those that had been abundantly manured and widely thinned out produced at the rate of 70 tons per acre, roots averaging 18 lbs. each. They then subject a portion of these roots—they do not give the quantity—to chemical analysis. The results given are 19,782 lbs. of dry

food per acre from the 46 tons 15 cwt., and only 11,681 lbs. of solid food from the 70 tons. Then he goes on to state the great advantage to the farmer in growing the small roots and small crop, but this is exactly opposite to my experience in this country. I never can get roots large enough. A large root is easier cleaned and makes better pulp, has more moisture in it and less of the bitter outside and tap-root, and consequently is more palatable to stock; and with all due respect for the analytical chemists of Europe and elsewhere, I know a judge of mangels that I'll back against the whole of their apparatus, viz., the pig that gets nothing but raw ones to live on. I have in my yard a number of breeding sows and a hog. These pigs, unless when the sows are suckling, get nothing else, summer or winter, but raw mangels, and they are always fat. Throw them a large mangel and a small one, they will devour the large one with relish, and leave the small one till hunger tempts them, and when they do tackle it they begin at the shoulder, eating down through the heart, evidently showing that could they express themselves in words they would tell us that the bitter taste of the skin and tap-root was not to their fancy. This small root growing may account in a great measure for the many complaints we hear and see in the press from people about the disagreeable flavour their milk and butter had when they fed their cows on mangel.

My system of growing mangels is a four course one, viz.:—1, mangel; 2, barley or wheat; 3, wheat; 4, oats; on a piece of ground suitable. There are some wet spots, but I keep putting in a drain. On to the fourth portion of this ground immediately after harvest I cart out all the manure I can scrape up, laying it on, if I have got it, at the rate of from thirty to fifty loads per acre, spreading and ploughing in at the same time, and as deep as the plough will work; and if it has not been subsoiled before, I take the mould-board off one plough, put three horses to that, and follow in the track of the first. This done, it is left in the rough all the autumn, then harrowed in the beginning of winter to make it level for either feeding off or ploughing in the green stuff in spring. In the months of August, September, or October, according to the season, I plough once as deep as I can, then slightly harrow, then put four horses to the scarifier and work it as deep as ploughed, up and down and across, until it is thoroughly pulverised, then draw drills with the double-mould plough, opening 10 or 12, then sowing broadcast in these drills bone-dust at the rate of 3 cwt. per acre. This done, the drill-plough goes down, splitting one drill, and comes up opening another, continuing to do so to the end of the field. I then mark the

drills for sowing the mangel with a wooden marker fixed to the drill-harrow that does two drills at a time, and drawn by a horse, then sow by hand in these marks at the rate of 3 lbs. per acre of my own grown seed. The person that sows goes with the wind and returns covering the seed with his heels—that is, he walks on the top of the drill with a foot on each side of the rut or mark, and draws in its edges with his heels as he walks along ; and when he is accustomed to it he can do it nearly as fast as he can walk.

I have the same objection to splitting the drills as I have to more than once ploughing. In both cases it turns in dry clods, and if late in spring the mangels may not braird ; but I never can get the bone-dust deep enough in marks or ruts ; it gets brought to the top in hoeing. To prevent this drill splitting I am now inventing a machine, on the drill principle, to sow both mangel and bone-dust at the same time. If I can manage this machine, I will exhibit it at the spring show, for the benefit of growers. This high drilling gives me the advantage that I can horse-hoe as soon as the mangels are well seen. I let the hand-hoeing and thinning at from 6d. to 1s., and found, per 10 chains of a single drill, the higher price being paid when the crop was sown early in August, during fine weather, which was succeeded by frosts and rough weather, that stopped the growth of the mangels, but not the rush of weeds ; but the lowest price I have paid, should it be seen by any of the agricultural community of England, must prove an eye-opener—sixpence and found for 220 yards of a single drill. The regular price of such work when I left home was 8d. per 1,000 yards, and find themselves. The second hoeing I get done at less than half that price, and in the same way, and horse-hoe as often as required. The pulling and topping costs about the same as the first hoeing, thus for labor making a total cost of from three to four pounds per acre.

The way in which I consume these mangels : The portion for a day's meal is scraped clean of dirt, and run through Bentall's root-pulper, and mixed up with from four to five times its bulk of chaff, sprinkling a little salt, and adding, when cheap, a little bran. I prefer the red mangel, as it moistens most chaff ; some of the other varieties require the hose turned on to moisten the same quantity. I save all the chaff I can from the threshing machine for this purpose. I have a body, very cheaply made, 12 feet long, on two wheels, railed round like a sheep hurdle, 4 feet high on two sides and front, with a boarded tail-board the same height, that folds down, and when the shafts are set up on long props it forms an inclined plane, so the chaff can be pushed up without lifting. I make my chaff heap where it is easy to drag it to

the mixing room in winter. I place a stack near where this heap is to be, and as soon as we begin to thresh I start a man with his cart, and he deposits the chaff and cavings mixed here, and, as soon as we have done threshing the other stacks, the machine is placed alongside this one, and the elevator on top of the chaff-heap, and it is threshed on to it, thereby securing it cheaply and safely for winter use, when we eat away, and use the straw for bedding as we work out the chaff underneath. When this chaff is mixed up with pulp, both my cattle and horses give it the preference to that cut from the best straw.

Such, gentlemen, is the way that I cultivate the mangel, and such is the way that I use it; and I am satisfied, although a seeming expensive crop to grow for those who have only a limited area of ground, no cheaper or healthier food can be given to idle horses, cattle, and sheep than that which I have described. I have had old horses worked down very poor, and turned out in winter on scarcely any grass, but brought into the stable every night and fed with about 40 lbs. of this mixture, and before a month they have got into fine condition. But both horses and cows must yield the palm to the well-bred pig for paying for a crop of mangel. I mean by a well-bred pig one that can live on raw mangel and be fit for the butcher at any time the farmer chooses, from the time he is weaned until he is full grown. I find he will give a pound a ton for them on the farm, less the labor of throwing them to him. About a quarter of a cwt. a day, with little else, will keep him—that is, from the time that he is weaned until he is fit for killing—say from 100 to 400 lbs. I lately sold a few under five months old that averaged 100 lbs. each, and returned me £2 per head net cash. These pigs did not eat a quarter of a cwt. per day, consequently they gave me more than a pound a ton for what they consumed. If the pork market could not be overdone, or if we had a good export trade in bacon and hams, I know of nothing that would be better for farming in this country than to go in wholesale for mangel growing and pig feeding.

A FARMER; WHAT SHOULD HE BE?*

By Mr. Alexr. Lumsden.

Gentlemen,

In attempting to describe a farmer, and what he should be, I am afraid the task I have taken in hand is more than I am qualified to do justice to; but if the subject be the means of provoking discussion, so far my aim will be served in bringing it before the club. Having followed the pursuit of agriculture close on forty years in different parts of the British empire, I have had opportunities of seeing different styles of farming carried on in the several places where I have been; and, in dealing with the subject, I want to point out that a farmer requires proper training if he would be equal to his business.

In most professions there is an apprenticeship required, and I think it is necessary to serve one to agriculture, to pursue it successfully. It would scarcely be fair to make comparisons between this new country and the older ones, in the conducting of farming pursuits. Our positions are widely different. In Britain, they have first-class training institutions, where agriculture can be taught, with the aid of science and practice, up to the highest standard. In the north of Scotland, where I served my apprenticeship, the work of the farm was carried on very systematically; and the youths went through a severe course of training, which had the effect of making good farmers of them, and inducing those who held subordinate places to pursue for promotion the strict discipline exercised on a well conducted farm, and the regularity and steady perseverance; it was wonderful the amount of work which was got over. Let me here remark the great difference which prevails here from the want of skilled labor, men who understand how to perform the work of the farm in all its branches. You may find a man a good harvester who can't hold the plough; so it will be seen farming is not a very flowery game in this part of the world, that is, following the pursuit of agriculture. If we suppose a man buys or rents a farm, and he intends to go in for mixed husbandry, we may also suppose he is possessed of capital to carry out his intentions. Well, he should be possessed of knowledge how to lay out his farm, to work it with the best economy, and if a site is suitable, the nearer the centre of his farm

* A paper read before the Warrnambool Farmers' Club on the 27th May 1875.

so much the better for the saving of labor, for the farm-steadings. These are not of such an expensive character as they are in the old country. Then he should be able to lay off his farm into fields for the most convenient working of it; if the natural features of the ground will permit, I would prefer the lands laid off south and north; but, if the land is wet, drainage has to be studied with regard to cropping.

A farmer should study what his land is best suited to produce; there are great mistakes committed in neglecting this, because there are very few farms but there is some difference in the soil. With regard to implements, the best is generally the cheapest; what will economize labor is the best to select. Great care should be taken in the selection of seeds—a shilling or two per bushel is well laid out if purity and soundness can be relied upon; and there is no better plan I know of than to select on the field where it is grown. There you can best see any imperfections, if there are any. From the system of threshing grain here, with the hurry and bustle attending the steam threshers, the different sorts of grain are very apt to get mixed, and, worse still, there is danger in getting spurious seed carried from one farm to another. For select sorts, the better plan is to hand-thresh it. Judgment is needed as to the quantity to allow per acre; some places can do with much less seed than others. A good seed drill, in my opinion, is the best method of putting the seed in the ground; the seed can be put to the proper depth, besides a great saving of seed is effected. The drill has another advantage; where the land gets dirty, the horse-hoe can be worked to do much good, and putting the coulters about nine inches apart leaves room for a current of air to pass between. Further, I believe it is partly a preventive from the hot winds injuring the grain. This is one of the reasons why I prefer the direction of the lands lying to south or north, and wheat especially gets the full benefit of the noon-day sun. In judging when the grain is fit to harvest, experience will teach that. I prefer taking wheat and oats with a green tinge, barley to be full ripe. There is one operation of the farm in this district which is very slovenly gone about, and which is frequently attended with a good deal of loss, viz., bad stacking. There are many of them built, one would imagine, to admit the wet, rather than to keep it out. It is a very unsafe practice, and one of the signs that training has been neglected.

Agricultural farming has been conducted up to the present time in this country in a loose and slovenly style, but this state of things won't last for ever. There is no doubt but science will be brought to bear, and assist to develop the natural elements lying dormant in old mother

earth. We have not experimental farmers here, of the Mechi of Tiptree Hall renown, although there may be many who are able to do great things if they had the opportunity. It has been remarked there is no royal road to success in the pursuit of agriculture, but it takes many years of acute observation and plodding industry to succeed. Elementary knowledge is good, and worth having; but how many have made shipwreck who depended on it alone, not being able to put their theories into practice, so that a farmer with the highest scientific training, if he is deficient in the knowledge of the field work of the farm, is very likely to be taken advantage of. To make good farmers, we want established here such an institution as Cirencester, in England, where scientific and practical knowledge are taught together.

With such a climate as we have in this colony, surely new products could be introduced which are worth a trial. But as that should be a national benefit, the State should have the control of it. There are large sums of money given in aid of mining pursuits; surely agriculture is worth a little fostering care.

With regard to manures, our mode of farming here does not allow the farmers to accumulate farm-yard dung, the stock being principally upon pasture; still artificial manures might be used to advantage. But we have the woolly sheep to bring to the rescue, which is the cheapest at the farmers' command at present.

With regard to stock, it should be studied what description of stock is suitable for the situation; some are suitable for sheep, others better for cattle. There are plenty of models of each sort to select from, from the very best down to the greatest trash. To be a good judge, you must know something of the nature of the animal you want to purchase; there are men who have got a sort of instinctive knowledge, a keen perception; at a glance they have form and quality all summed up at once, and can make up their minds in a moment if the animal suits them. Others, by study and long practice, can acquire it. Care, and looking after the comfort of stock, will generally meet its reward. With the improvement in the breed of all kinds of stock which is taking place in Victoria, at no distant day, she will be able to cope with any country. If our large stock owners would make it a point to attend our local shows, and send some of their improved breeds, it would assist to raise the public taste; it is amazing the apathy that is in existence in this part of the colony. A stranger visiting some of our shows would be set to wonder what was the matter.

I extract from a paper read in Aberdeenshire on Cattle Breeding and Feeding—In 1740, cattle did not come to maturity till they were ten

or twelve years old; then about 1810 they began to improve, cattle five years old weighing 5 to 7 cwt.; and the progress has kept marching on, so that now a beast two years old goes to the shambles and brings down the respectable weight of 10 to 11 cwt. It is computed that fat stock, live and dead, brought back to the county one million pounds sterling last year, and this has been done by careful breeding. Whether it is agriculture, or the rearing and breeding of stock, it has to be followed with close observance and unceasing perseverance.

Discussion.*

Mr. W. Anderson, President of the Villiers and Heytesbury Agricultural Association, stated that he had listened to Mr. Lumsden's paper with much interest, and had since refreshed his memory by perusing it in the local papers. He quite endorsed the views set forth, and was of opinion that any information which would tend to improve the minds of the young farmers should be encouraged. They would be enabled to ascertain the best kinds of crops to cultivate, and to know how other operations on their farms could be best carried out, by studying the views of practical men, and he hoped that more of such information might be forthcoming. The time had arrived for the establishment of agricultural colleges, and he hoped that this district would not be forgotten. In fact, he regarded it as being the best part of the colony for an institution of such a nature. He was not prepared to find any fault with the opinions expressed by Mr. Lumsden in his essay.

The opinion of Mr. G. Bruce, Mayor of Koroit, was asked by the President. Mr. Bruce said he endorsed the views of Mr. Lumsden and of Mr. Anderson, but the question which had been uppermost with him was, not what a farmer should be, but how he could make the most money?

Mr. J. H. Irvine thought that the proposal to form an agricultural college here was worthy of their earnest consideration. There was no district in Australia so well adapted, by its soil, climate, and other advantages, for the study of such questions and for training young men in farming pursuits.

* Abridged from the report published in the *Warrnambool Standard* of the 3rd August 1875.

JUDGES' REPORT ON PRIZE FARMS IN THE SMEATON AGRICULTURAL DISTRICT.

GENTLEMEN,

Having concluded our inspection of the farms, live-stock, and crops entered for the prizes offered by your society for the best managed farm over 100 acres in extent, we would now recommend that the following awards should be made :—

For farms over 100 acres there were three entries—Mr. Jas. Talent, Mr. Archibald Anderson, and Mr. John Trewin. Inasmuch as recently purchased land has been added to each of the three farms, and the results of the different systems of management are not yet shown fully developed over the entire holding in any one instance, while each competitor is pursuing a course of improvement in the highest degree creditable, and well calculated to promote improved farm practice in the district ; and further, considering that, under present circumstances, it would be unfair to single out any one of the three as an example superior to the other two ; we are unanimously of opinion that the best mode of recognizing the merits of each, and at the same time of promoting the object your society has in view in offering these prizes, would be to divide the prize money equally among the three competitors.

WM. SCOTT,
JOSIAH MITCHELL,
JOHN LEISHMAN,
} Judges.

We also desire to lay before you the following reports on the various farms.

16th December 1874.

WATTLE GROVE.

The first farm we inspected was the freehold property of Mr. Jas. Talent, and contains 158 acres. Originally the land formed two farms, separated from each other by a narrow strip of a reserve ; and this severance, small though it is, will in some measure add to the cost of working it in one. The first purchased portion of Mr. Talent's farm—that on which the homestead stands—lies on the southern slope, near

the base of Scrub Hill. The soil is a rich chocolate, naturally drained, resting on a subsoil similar in color to the surface soil, but of a greasy and marl-like consistency. The second, and recently purchased portion (80 acres), lies south of the first, and has a frontage to a good road leading from Kingston to Dean. The soil of this portion varies from good chocolate to a poor loam in places, underlaid by ironstone gravel. These poor patches, on which the surface water formerly stood, have been under-drained at considerable cost, and thus improved. A small runlet, called the Back Creek, winds its way through the last purchased portion, and along the southern boundary of the first, affording an ample supply of water at all seasons to both.

The Homestead.—In addition to a commodious and substantially-built residence of brick and stone, with a detached kitchen, the other buildings comprising the homestead are the men's room, granary, stables, chaff-house, cart-shed, joiner's shop, and piggeries, all of wood, and in good repair. Forming one end of the farm-yard is the stack-yard, and adjoining the stack-yard are a couple of straw-yards, in which cattle are kept well littered and fed—the milch cows with clover hay, and the young stock with straw—during the winter nights. The hay or straw is placed in racks fixed in the centre of each yard. By this system of management the whole of the straw, and much of the hay, grown on the farm is advantageously converted into manure, and applied to root crops and the top-dressing of grass land. In front of the dwelling-house is a small but well-kept garden, of about one-fourth of an acre, and on the slope leading down from the farm-yard to the creek an acre of orchard, planted several years ago, with the usual assortment of fruit trees. The ground under the fruit trees has been sown down with cow-grass (perennial red clover), which is part used as green fodder and part made into hay. In one corner of the orchard Mr. Talent has a small plot of cocksfoot grass for seed, which he intends using in his mixture of grass seeds. From the way in which this grass thrives wherever sown in the district, we are of opinion that it might be more largely used with benefit, as being a good late summer grass.

Subdivision and Fences.—The farm is subdivided into twelve fields, of from ten to twelve acres each, exclusive of orchard, garden, and about seven acres of a timber reserve. The boundary fence, and also the inner fences of the farm, consist of substantial three-rail fencing. White thorn has been planted on a portion of the boundary along the road leading to the homestead, and the hedge is progressing favorably. Mr. Talent approves highly of the white thorn as a hedge plant, and intends year by year extending the planting of it, to take the place of

the post and rail fences. Cape broom, planted many years ago, proved such a useless nuisance that it was grubbed up and got rid of.

Pasture Land.—There are thirty-five acres sown down with English grasses and clovers, and ten acres of natural pasture. The mixture of grasses used consists of rye-grass, cocksfoot, a little Yorkshire fog, and white clover. These are sown mostly without a crop.

Grain, Pulse, and Root Crops.—Wheat, forty-three acres. Purple straw, Frampton, and white Kent are the varieties Mr. Talent finds to answer best, and of these the purple straw is found to be most suitable for late sowing. Caterpillars having destroyed the barley crop in former years, none was sown this year. Oats of the Tartarian variety occupy fifteen acres; peas — early dun and blue imperial — twenty acres; and potatoes ten acres. A few carrots are also grown, and a little maize for green feed in summer. The grain crops are sown broadcast; the peas part in rows and part broadcast, using two and three bushels of seed to the acre, and obtaining an average yield of about forty bushels per acre. Potato planting is done in October and November. The sets are placed in rows thirty inches apart, and twenty-four inches from set to set in the rows. Part of this season's crop has been manured with manure made in the straw-yards (already alluded to), and part with guano. The farm-yard manure was spread broadcast on the surface, and ploughed in at the time of planting.

Rotation.—The rotation pursued by Mr. Talent is—1st. A grain crop—rarely two in succession. 2nd. Green crop—potatoes, carrots, &c., or a summer fallow. 3rd. Grain. 4th. Grass—sown sometimes along with the grain crop, and at other times alone after the grain crop has been cleared off. The land is then allowed to lie two or three years in grass, and used as pasture, or the grass cut for hay. In addition to the manure made on the farm, bone-dust has been used at the rate of four cwt. to the acre, occasionally as top-dressing to grain crops, but mostly to root crops. During the past three years, from £50 to £60 have been spent in artificial manures.

Live-Stock.—The live-stock kept on this farm consists of seven horses—five mares and two geldings; eighteen head of cattle—including cows, heifers, and steers; and five pigs. The horses are of a good, useful stamp for farm work. The cattle are no particular breed, but a young, well-bred shorthorn bull has been recently purchased, and in the field along with him we noticed a cow showing good breeding. Through the winter six or seven cows are milked and butter made. The pigs, which are of the large white breed, are sold off when from

200 to 300 lbs. weight to Chinamen. No sheep have been kept on the farm up to the present time, but it is Mr. Talent's intention to introduce a small flock when he has got the recently purchased portion of his farm, as far as fences are concerned, brought into proper order.

Implements, &c.—Double and single furrow ploughs, grubber or cultivator, horse-hoe, harrows, drays, and reaping-machine, all of good make and in good working order.

General Remarks.—The growing crops on the first purchased portion of Mr. Talent's farm are remarkable good. The same may be said of the pasture land sown down with English grasses; the whole speaking well for the skill and industry brought to bear on the management. By the system he has pursued, Mr. Talent says he has been able to render cultivation profitable, and at the same time to maintain the fertility of his land. Some of the land has been sixteen years under cultivation, and assuredly the appearance of the crops and the pasture land afford no evidence of poverty or wearing out. On the recently purchased portion of the farm—which only came into Mr. Talent's possession about twelve months ago, and in very foul condition—the crops are not so promising. Yet on this portion we have already proof of the same skilful management. A channel has been cut for the creek, which formerly spread out and formed a swamp of the low land. The cutting of this channel has laid the ground on each side of it dry, and available for grazing. Old log fences along the course of the creek are being split up and removed, and along the roadside new ones of substantial post and rail have been erected. The wet portions of some of the fields have been relieved of stagnant water by the construction of underground drains. These drains are from three to four feet in depth, formed with an open channel below and filled in with rubble stone to within fourteen inches of the surface, the cost being from 15s. to 20s. per chain. The old buildings are being cleared away, and further improvements in the direction of a more convenient subdivision of fields are projected. In the hands of its present owner this portion of the farm is bound to undergo great improvement, and with the proposed introduction of sheep will doubtless add to the profits of the entire farm. Reviewing the whole of what we saw, and according full credit to Mr. Talent for the skilful management he displays, we cannot but regard the large extent of cultivation, in proportion to the area under pasture, and the consequent limited number of live-stock he is able to keep, as the weak point in his otherwise excellent system of farm management, and one that, in our opinion, would tell against its general adoption in the district.

Green Hill Farm.

Green Hill farm, the freehold property of Mr. Archibald Anderson, contains 590 acres, subdivided into fifteen fields, varying in extent from 20 to 47 acres, exclusive of four small enclosures, containing 2 to 4 acres each. From the eastern boundary, on the summit of Green Hill, Mr. Anderson's land extends down the western slope to the level country below. On the north it is bounded by a road leading to Daylesford, and on the south by the Clunes water reserve. The character of the soil varies from a good chocolate on the upland, mixed, in places, with small-sized stones of light honeycombed basalt, to a strong loam with a clay subsoil on the lowland. In the natural depressions on this clay formation, water from the surrounding land collected and formed miniature swamps, until removed by evaporation. The construction of 1,200 chains of rubble drains, averaging 2½ feet in depth, at a cost of 7s. 6d. per chain, has effectually reclaimed those wet patches, and got rid of what might have become dangerous nurseries for the propagation of fluke. The drained land is now available at all seasons, and Mr. Anderson is of opinion that nothing he has done on the farm will pay so well for the outlay as the investment he has made in draining. Formerly the land now owned by Mr. Anderson constituted four separate farms, and much of it had been pretty well worked out in the production of ten successive grain crops before it came into his possession. Recently, sheep have been introduced by the present owner, and, with the aid of these invaluable animals, a change is taking place, from spoliation, which leads to ruin, in the direction of a rational, enduring, and profitable system of husbandry.

The Homestead.—The buildings comprising the homestead are not compactly arranged. They present a straggling appearance, but being all (except the granary) of wood, they may be regarded as temporary, and the advantage of the present arrangement is that, in the event of fire, there would be no danger of a clean sweep being made. The commodious dwelling-house, with large detached kitchen, is prettily situated on the slope near the foot of the Green Hill, and commands an extensive and beautiful view of the surrounding country, including the fine sheet of water formed by the Clunes reservoir on the south-west. In front of the house is a small garden, and behind it an acre of orchard planted five years ago with the usual assortment of fruit-bearing trees and bushes—apples, pears, plums, cherries, gooseberries, currants, &c. The supply of water for domestic purposes is obtained from a spring, which rises in the hill at the back of the house. Rain-water is also stored

for use in a large and well-built brick and cement tank constructed for that purpose. At a short distance below the house stands a good six-stall stable, with chaff-house at one end, and feed-house at the other. Adjoining the stable on the north there is a large shed for protecting a portable steam-engine and threshing-machine from the weather, when not at work on the farm or in the district. South of the stable stands one of those useful and cheap structures—a Dutch barn—capable of containing 25 tons of hay. The other buildings are—joiner's and blacksmith's shop, cart-shed, shearing-shed (with convenient drafting pens), and granary—the two latter at some distance from the rest. The granary is a substantial building of bluestone, 54 ft. x 24 ft., in which the arrangements for storing grain are very complete. The lower floor is raised three feet above the ground level, and well ventilated below. On this floor five bins are arranged, capable of containing 7,000 bushels of grain. The upper floor is also arranged with bins, affording accommodation for storing 5,000 bushels of grain in 500 to 1,000 bushel lots, and while trap-doors supply a ready means of passing grain to the floor below, a platform on a level with the lower floor in front, and another platform extending from the upper floor to the rising ground behind, do away with the necessity of lifting sacks. All the grain can be trucked with ease and expedition to or from the drays. Wells, dams, and a small creek furnish water for stock on the farm. One of these wells, forty-eight feet deep, worked by a force pump, and situated a short distance from the granary, yields an unfailing supply.

Fences.—Substantial three-rail fences form the boundary as well as most of the inner dividing fences. All are sheep-proof, but as yet no hedges have been planted.

Pasture Land.—440 acres have been sown with artificial grasses, and there are seventy acres of natural pasture. The grasses sown, and the quantity per acre, are—1 bushel of rye-grass, 3 lbs. cow-grass (perennial red clover), and 2 lbs. white clover. Mr. Anderson prefers sowing without a crop. Hitherto the seeds have been sown by hand, but in future a broadcast drill, recently purchased, will be used for that purpose, as being more expeditious and more accurate in their distribution. The seventy acres of natural pasture, divided into two fields, is the poorest land on the farm, and on part of it the timber has been allowed to stand.

Grain and Root Crops.—These consist of wheat, thirty-five acres; barley, ten acres; oats, ten acres; and potatoes, twenty acres. Part of the wheat crop sown in June was fed down with sheep about the first of September. Mr. Anderson is an advocate of this practice, which he

has found produces clean healthy straw and fine ears of grain. His last year's crop was twice fed down, and yielded thirty-six bushels of good wheat to the acre. Purple straw wheat, Cape barley, Tartarian oats, and Norway oats—seeds of the latter having been obtained from the Smeaton Agricultural Society—constitute the varieties of grain grown this season.

Rotation.—No rotation has hitherto been attempted, but now that he has by sowing down got the place in order, Mr. Anderson intends pursuing the following course of cultivation :—First, green or root crops, mainly potatoes ; second, grain ; and third, grain—after which the ground will be sown down with grasses and clovers. How long artificial grasses will stand, or may be allowed to stand profitably without breaking up the land and resowing, is a problem he has yet to solve. So far as present experience goes, they have stood eight years on one portion of the farm.

Live-Stock.—The live-stock on the farm consists of the following :—Sheep : 280 large-framed cross-bred Leicester ewes ; 350 merino ewes ; and over 800 lambs; or in all 1,500. Some of the lambs had been purchased just prior to our visit. Horses ; two draught mares, two geldings, and one saddle mare. Cattle : sixteen young heifers, ten working bullocks, two milch cows, and a couple of pigs. No dairying is carried on. The milch cows are kept merely to supply domestic requirements in the shape of milk and butter. The pigs utilize the refuse of the kitchen until they are full grown, when they are grain fed, and converted into bacon for home consumption. Mr. Anderson says the sheep will pay him very well. His calculations are based on the very moderate estimate of his land being able, without over-stocking—for he is a firm believer in the advantages of under-stocking—to carry two large-framed ewes the year round and their progeny through the summer months. This year he has had ninety per cent. of lambs, and at shearing 100 third cross Lincoln-on-merino ewes gave him 1,050 lbs. of wool (exclusive of locks and pieces), which brought 11¼d. per lb. He prefers the cross-breds, because they give more wool and more mutton ("double as much") for the same amount of food than the merinos. The wandering habits of the merinos, he says, render them unsuitable for farms with small enclosures. In winter the sheep are shifted into fresh pasture once a week, and sometimes every three days. The change and clean feed are found to be both beneficial and necessary. From the 20th to the 30th of March he considers the best time for putting the rams with the ewes. By the use of pure-bred rams, and careful selection from the progeny of his best ewes, Mr. Anderson aims at working gradually

into a good, useful flock of long-woolled sheep. Last year imported Lincoln rams bred by Mr. G. S. Deans were used, and have left fine lambs.

Implements, &c., consist of double-furrow plough—Kelly and Preston makers—single-furrow ploughs, grubber, horse-hoe, reaping-machine, &c. —all of a good useful kind.

General Remarks.—The grain crops are moderate; feed on the pasture land abundant; silver grass rather too plentiful in some of the pastures; thistles almost nil; sheep in good condition; horses of a good stamp—two capital geldings, one by Blackleg, and the other by Cromwell; oats are all crushed and hay chaffed for the horses; cattle in good condition, but no particular breed; the working bullocks and young heifers serve a useful purpose in the clearing up of rough herbage after the sheep, and sheep form the leading feature of the new system of farm management. Until recently, grain growing, not only on this farm, but throughout the district, was the staple industry, and under constant grain growing the land became considerably "worked out." But from the fact that bone manure, applied at the rate of even 8 cwt. per acre to grain crops, failed in producing any visible effect, it may be inferred that the partial exhaustion of the soil, consequent on the system of grain growing pursued, is due rather to loss of vegetable matter than to any deficiency in the mineral constituents of the soil. Should this surmise prove correct, the present system of management which Mr. Anderson has wisely adopted—that is the combination of sheep with tillage, and the large proportion of pasture to arable land—will restore the fertility of the soil, and this desirable consummation will be all the more quickly brought about by the prudent course of under-stocking and judicious grazing he pursues. Mr. Anderson's farm practice is at present in a transition state. He is changing from constant grain growing to an enduring system of husbandry; therefore complete results are not yet shown. But we are of opinion that the course he is pursuing with such praiseworthy skill and perseverance is one that may safely be recommended for adoption, under like circumstances, in the district generally, as being well calculated to prove "lastingly remunerative," and to lessen risks arising from the vicissitudes of seasons. We would, however, add that on soils which may have become impoverished through exhaustion of the available mineral substances, the application of phosphatic manures—bone-dust or Malden Island guano—would be necessary for the restoration of fertility, the production of grain crops, and for rendering the herbage more nutritious in the feeding of stock.

Spring Vale Farm.

Spring Vale farm, the freehold of Mr. John Trewin, contains 350 acres. Situated on the gentle eastern slope of a considerable hill, warmed by the first rays of the morning sun, and amply sheltered from the cold west winds, the site is at once a cosey and cheerful one, such indeed as it would be difficult to surpass in the Shire of Creswick. The excellence of the site is equalled by the quality of the soil, originally a rich chocolate of volcanic formation resting on a marly subsoil. Before falling into the hands of its present owner, like too many other farms in the district, Spring Vale underwent a severe scourging in the production of numerous successive grain crops. The farm is subdivided into 11 fields—four of 40 acres each, four of 30 acres each, one of 35 acres, one of 32 acres, and a small one adjoining the house, containing 2 acres. Springs, wells, and dams supply the farm with water.

The Homestead.—Built, regardless of cost, by the former owner in the palmy days of grain growing, abundant yields, and high prices, the dwelling-house is a substantial structure of bluestone. A detached kitchen is of the same durable material, and so also is the barn or granary, 52 feet long by 32 feet wide, which stands at a short distance from the house. West of the barn are the stables and stock-yards. The stables are of wood, and have been built some years. A garden of about an acre in extent surrounds the dwelling-house, and is planted with fruit and ornamental trees.

Fences.—The boundary fences are of substantial post and rail—in some places two rails and one wire, and in others two rails and two wires. The inner dividing fences are of the kind last-named, and are all sheep-proof. Except around the small field near the dwelling-house, and the garden, no live fences have yet been planted ; but Mr. Trewin intends planting, and gives preference to the white thorn as a hedge plant, which he finds, with care during the first four or five years, makes a capital fence. Last year a mile of fencing was sown with prickly acacia, but frost destroyed the young plants.

Pasture Land.—There are sown with English grasses, 132 acres ; natural pasture, 40 acres. The grasses are sown at the rate per acre of one bushel of rye-grass, 2 lbs. cow-grass (perennial red clover), 2 lbs. white clover, and 1 lb. each of trefoil and rib-grass. Two of the fields were sown with and two without a crop ; but Mr. Trewin prefers sowing grass seed without a crop. He sows with the first autumn rains, and disapproves of feeding the young grasses down before they are well established.

Grain and Root Crops.—Wheat, 45 acres; barley, 35 acres; oats, 15 acres; potatoes, 34 acres. Forty acres recently purchased, and in foul condition, were being worked as a bare fallow, to get the ground in order for a grain crop and sowing down to grass. Purple straw and white Kent are the varieties of wheat grown this season. The former is used for late sowings; but on good land the white Kent is preferred. The purple straw is found to suit best on the poorer land. Last year the average yield of purple straw and Frampton was 25 bushels to the acre. The white Kent—following a crop of potatoes which yielded ten tons to the acre—gave 40 bushels an acre. The wheats are usually drilled and afterwards horse-hoed; this year, owing to Mr. Trewin having met with an accident and broken his leg, they were sown broadcast. Through some blunder on the part of the farmer who sold to the seed merchant, or on the part of the merchant who supplied Mr. Trewin, several sacks of the seed barley this year unfortunately happened to be a different and later ripening variety than the rest. This error detracted from the appearance of the barley crop. In connection with potato planting, Mr. Trewin has adopted a method of planting which deserves special mention, since it lessens the cost of that operation. The double-furrow plough, on which a box and a spout are fixed, is used for putting in the crop. When the work is fairly started, every second time round seed potatoes are placed in the box, and a boy mounts the plough and drops the sets one by one down the spout, which delivers each set safely between the two furrows as the plough proceeds. In this way seed potatoes are deposited with ease and expedition in every fourth furrow at distances of from 20 to 24 inches apart in the furrow, and without the least risk of being trodden by horses' feet, or disturbed in any way. The appearance of the crop just above ground spoke well for the way in which the planting had been done. About two acres of mangels are grown; the yellow globe is preferred. They are carted off the land, and fed to cattle, sheep, and pigs. The ground is well dressed with 30 loads of well-rotted farm-yard manure to the acre, and 3 cwt. of bone-dust sown along with the seed. The seed is sown in drills 30 inches apart, and the plants are thinned out to stand two feet apart in the rows. Mr. Trewin is also an advocate for the top-dressing of pasture land; and a portion of one of the fields has been top-dressed this summer with rough farm-yard manure. Artificial manure—bone-dust—to the amount of £40 worth, has been bought during the past three years.

Rotation.—The rotation which it is intended to carry out is the following:—1st year, potatoes, and a small proportion of mangels; 2nd,

wheat or English barley; 3rd, oats; 4th, wheat or barley, and then down to grass. How long artificial grasses may be allowed to stand has yet to be proven. This and other unforeseen causes may render some modification of the proposed course of cultivation necessary. Under present circumstances, Mr. Trewin is of opinion that it would be impossible to determine upon any undeviating course of cropping. For instance, if clovers are found to prevail over rye-grass, when the sown-down land comes to be broken up again, instead of a green crop, he would take a crop of wheat from the clover lea.

Live-Stock.—These consist of eight horses—two brood mares, four geldings, and a couple of hacks; the draught horses being of the excellent stamp of farm horses usually met with in the district. Cattle—two milch cows (superior), and two heifers. The cows and a few pigs are kept for home use. Sheep—500 wethers, 250 cross-bred Lincoln and Leicester ewes, 200 lambs, six pure Leicester ewes (from Mr. Robertson's flock), six Leicester ewes (bred by Mr. Sladen from imported stock), and three pure Lincoln rams (to one of which, bred by Mr. T. Bath, a second prize was awarded at the last Smeaton Show). The wethers, when fat, will be sold off. Mr. Trewin's intention is to breed into a flock of long-woolled sheep, valuable alike for wool and carcass. Evidence that success has attended him so far in this direction is afforded by the fact that 200 large-framed two-tooth ewes, bred on the farm, at shearing averaged 9 lbs. of wool each. Mr. Trewin finds that cross-bred sheep manure the ground more evenly than merinos, as they have not the habit of camping always in the same place, which the merino has. He intends constructing sheds round the farm-yard to afford shelter for the sheep in winter. The farm implements, machines, waggons, &c., are all new, and by the best makers.

General Remarks.—Grain crops only moderate; potatoes clean and promising; pasture land—that sown down with English grasses and clovers—in fair order; feed abundant, and all the stock looking well. On the forty acres of natural pasture, stumps have been grubbed, and preparations made for the clearing away of all dead timber before breaking up the ground. The farm generally is naturally drained, but a few wet patches on portions of ground recently purchased it is intended to drain. It appears to us that since Mr. Trewin, about three years ago, became the owner of Spring Vale farm, he has, with highly commendable enterprise, skill, and energy, applied himself to the gradual and systematic improvement of the place by the erection of substantial fences, &c., and also to the introduction of an enduring system of cultivation, by sowing grasses, and combining the production of wool and

mutton with the growth of grain and root crops. Additional purchases of land have recently been made, but time has not yet permitted of these being brought into the order it is intended they shall be. With Mr. Trewin, therefore, as with Mr. Anderson and Mr. Talent, both of whom are also dealing with portions of recently purchased land, complete results over the whole of the farm have not yet been developed. Much is intended to be done that is now not done, simply because sufficient time has not elapsed to admit of the projected improvements being carried out. Yet, notwithstanding the fact that complete results are not shown, we are of opinion that the course Mr. Trewin is pursuing is in the direction of an improved and rational system of husbandry. Systems of farm management cannot be profitably changed in one or two seasons. Time is an important factor in the working out of such changes. What relative proportion the pasture land should bear to the arable land on any farm must be regulated by careful consideration of a variety of circumstances—such, for instance, as the size of the farm, proximity to markets, labor supply, &c. The kind of live stock that may be most profitably kept will also be governed by like considerations —by climate, and by the nature and quality of the soil, &c. But, speaking generally of the Creswick and Smeaton Districts, taking into consideration the present and the probable future values of labor and produce, and bearing in mind that the cost of cultivation is certain, and profitable returns more or less doubtful, we are of opinion that the larger the area of pasture land in proportion to the arable land, and the greater the number of stock that are kept, and kept well, on the farm, the safer the system of farming will be, and the more likely to prove "lastingly remunerative."

JOSIAH MITCHELL,
WM. SCOTT,
JOHN LEISHMAN,
} Judges.

To the President and Committee of the
Smeaton, Spring Hill, and Bullarook Agricultural Association

REGULATIONS ISSUED BY THE DEPARTMENT OF AGRICULTURE DURING FINANCIAL YEAR 1874-5.

Beetroot Sugar.

The Administrator of the Government, with the advice of the Executive Council, has approved of the following Regulations in connexion with the vote of £5,000 for the encouragement of the manufacture of Sugar from Beetroot grown within Victoria, viz. :—

1. Any person or company desirous of competing for the above-mentioned vote shall intimate his or their intention in writing to the Minister of Agriculture.

2. Two clear days' notice in writing at least shall be given to the Minister of Agriculture of the intention to commence operations for the season in any competing factory.

3. An accurate record shall be kept in every such factory of—

(*a.*) The quantity of roots supplied ;

(*b.*) The dates upon which the same were supplied ;

(*c.*) The price paid per ton for the same ;

(*d.*) The name and address of the person by whom the same were grown ;

(*e.*) The quantity worked up ;

(*f.*) The dates between which the same were worked up ;

(*g.*) The purposes to which the same were applied ;

and a copy of such record shall be furnished to the Minister of Agriculture on every fourteenth day from the date upon which the first supply of the season's roots was made, and shall continue to be so furnished until the whole of the roots shall have been converted into sugar, or otherwise disposed of.

4. Any officer appointed by the Minister of Agriculture to inspect beetroot sugar factories shall have power to visit such factories at any time during the hours of work, to inspect any portion or portions thereof, and to remove, in sufficient quantity for the purposes of analysis, samples of beetroot, or any product obtained during the several stages of the process of manufacture.

5. The manager of any competing factory shall, when required in writing so to do, furnish to the Minister of Agriculture a return showing

the number of persons employed in the factory under his supervision, the average quantity of marketable sugar obtained from one ton of beetroot, and such further information as may be required from time to time.

6. The sugar as it is manufactured, unless required for immediate sale, shall be deposited in a room on the premises, and the key of such room shall be kept by an officer of the Department of Agriculture, and no sugar removed from the factory shall be included in any claim made on the vote, unless the same shall be removed in the presence of an officer of the Department of Agriculture.

7. When it is desired to dispose of a part or of the whole of the manufactured sugar, or to remove a part or the whole of the same from the factory, notice in writing shall be given to the Minister of Agriculture, and such notice shall specify the hour at which it is desired to remove the sugar for sale or otherwise.

8. When sugar shall have been removed from a competing factory, it shall not be re-admitted to the factory on any condition whatsoever; nor shall sugar of any description, excepting that manufactured on the premises from beetroot, be allowed within the factory.

9. A sum of £500 will be paid to any person or company on production of a certificate from the inspecting officer that he or they have manufactured locally from one manufactory, between the dates of 1st July 1874 and 30th June 1875, and in accordance with these regulations, a quantity of not less than fifty tons of sugar from beetroot grown within Victoria; and a sum of £10 per ton will be paid for every one ton manufactured in excess of fifty tons.

J. J. CASEY,
Minister of Lands and Agriculture, and
President of the Board of Land and Works.

Department of Agriculture,
Melbourne, 25th January 1875.

Encouragement of the Production of Flax and Silk.

The Administrator of the Government, with the advice of the Executive Council, has approved of the following Regulations for the expenditure of the vote of £1,000 for the encouragement of the production of Flax and Silk, viz.:—

1. The vote (£1,000) shall be made available in sums as under, viz.:—

(*a.*) For the encouragement of the establishment of a flax mill	£350
(*b.*) For the invention and manufacture of flax-harvesting machinery	200
(*c.*) For the encouragement of the cultivation of mulberry trees, and the production of silk	300
(*d.*) To defray judges' expenses in connexion with the trials of flax-harvesting machines, and the inspection of mulberry plantations	150
	£1,000

Establishment of a Flax Mill.

2. One hundred pounds (£100) out of the sum set apart for the encouragement of the establishment of a flax mill will be paid to any person or company who may produce evidence to the satisfaction of the Government that he or they have manufactured locally from one manufactory, and between the dates of the 1st July 1874 and the 30th June 1875, a quantity of not less than twenty tons of marketable fibre from flax grown within Victoria, and a sum of £5 per ton will be paid for every one ton manufactured in excess of twenty tons.

Invention of Flax-harvesting Machinery.

3. The sum (£200) set apart for the invention and manufacture of flax-harvesting machinery shall be awarded in premiums, on such conditions, in such amounts, as the Minister of Agriculture may hereafter direct; and provided:—

(*a.*) That an equal sum be subscribed jointly by the Adelaide Chamber of Manufactures and the Royal Agricultural and Horticultural Society of South Australia, with the concurrence of the South Australian Government, and that the same be offered in conjunction with the Department of Agriculture of the Colony of Victoria.

(*b.*) That such joint premiums shall be open for competition in South Australia and Victoria.

(*c.*) That trials of the competing machines shall be held in either colony.

Cultivation of Mulberry Trees and Production of Silk.

4. The sum (£300) set apart for the encouragement of the cultivation of mulberry trees and the production of silk shall be awarded in premiums, subject to conditions as under:—

5. To any person or company who, in the opinion of judges to be appointed by the Minister of Agriculture, may obtain the most satisfactory results from areas, as hereunder specified, planted with mulberry trees of not less than three years' growth, the subjoined premiums:—

For ¼ acre...	£10
„ ½ „	20
„ 1 „	35
„ 2 „	55
„ 4 „	80
„ 8 „	100
	£300

6. Persons desirous of competing for the above-mentioned premiums must intimate their intention in writing to the Minister of Lands and Agriculture, specifying the premium or premiums for which it is their intention to compete.

7. Competitors shall afford the judges access at all reasonable times to their mulberry plantations and buildings used in the rearing of the worms, and shall furnish them with such information as they may require from time to time.

8. Persons will not be permitted to compete for two or more separate premiums with one and the same area of mulberry trees.

9. No prize will be awarded where it cannot be shown to the satisfaction of the judges that operations are conducted with regard both to profit and the permanent establishment of the industry.

Judges' Expenses.

10. All reasonable expenses incurred by persons appointed by the Minister of Agriculture to act as judges of flax-harvesting machinery in South Australia and Victoria, and to inspect and report on mulberry plantations, shall be made a charge on the vote.

J. J. CASEY,
Minister of Lands and Agriculture, and
President of the Board of Land and Works.

Department of Agriculture,
Melbourne, 25th January 1875.

Horticultural Societies.

Regulations for the Distribution of the Sum of £500 *granted by Parliament in aid of the Funds of the Horticultural Societies of Victoria,* 1874–5.

1. That each society furnish to the Minister of Lands and Agriculture, on or before the 1st March 1875, a statement in the form marked A, which must be verified by statutory declaration in the form marked B.

2. That on receipt of the above-mentioned statement, so verified, the Minister of Lands and Agriculture will cause to be paid to the treasurer of each society a sum equal to the amount of the revenue shown to have been raised by members' subscriptions and private donations, provided that the sums claimed do not exceed in the whole Five hundred pounds; and if they should exceed this amount, that they be reduced *pro rata.*

3. That no society whose revenue derived from members' subscriptions and private donations amounts in the total to less than Fifty pounds shall be entitled to participate in the vote.

(A.)

Showing the Revenue of the Horticultural Society derived from members' subscriptions and private donations, and exclusive of any sum or sums received from the Government, admission fees, entrance fees, or from any other source, between the 1st January 1874 and the 31st December 1874.

Members' Subscriptions.			Private Donations.			Total.		
£	s.	d.	£	s.	d.	£	s.	d.

Treasurer of the
Horticultural Society.

Date—

(B.)

DECLARATION.

I, the Treasurer of the Horticultural Society, do solemnly and sincerely declare that the amount of revenue derived by the said society from members' subscriptions and private donations, and exclusive of any sum or sums received from the Government, admission fees, entrance fees, or from any other source, between the 1st January 1874 and the 31st December 1874, amounted to the sum of pounds shillings and pence (£).

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of an Act of the Parliament of Victoria rendering persons making a false declaration punishable for for wilful and corrupt perjury.

Treasurer of the
Horticultural Society.

Declared before me at this day of 187 .
Justice of the Peace.

AGRICULTURAL SOCIETIES.

Regulations for the Expenditure of the sum of Seven thousand pounds (£7,000) *granted by Parliament in aid of the Funds of the Agricultural Societies,* 1874–5.

1. That each society furnish to the Minister of Lands and Agriculture, on or before the 1st March 1875, a statement in the form marked A, which must be verified by statutory declaration in the form marked B.

2. That on receipt of the above-mentioned statement, so verified, the Minister of Lands and Agriculture will cause to be paid to the treasurer of each society a sum equal to two-thirds of the amount shown to have been paid away in prizes (except for the exhibits mentioned in the statement above referred to), on condition that this sum do not exceed the amount raised by members' subscriptions and private donations; and if it do exceed the same, that it be in that case reduced to a sum equal to the amount so raised.

3. That out of the whole grant (£7,000), a sum not exceeding Six thousand five hundred pounds shall be so divided; and if the sums claimable be in excess of this amount, they shall be reduced *pro rata.*

4. That Five hundred pounds be paid to the National Agricultural Society of Victoria towards the expenses of its Annual Spring Show held on the 2nd, 3rd, and 4th November 1874, under the patronage of the Department of Agriculture.

5. That no society whose expenditure in prizes between the 1st January 1874 and the 31st December 1874 amounts in the total to less than £100 shall be entitled to participate in the vote.

6. That any balance that may remain on the vote after all claims, in accordance with the above provisions, shall have been satisfied, shall be divided among the Farmers' Clubs of Victoria in such manner as the Minister of Agriculture may direct.

(A.)

SHOWING the Revenue of the Agricultural Society derived from members' subscriptions and private donations, between the 1st January 1874 and the 31st December 1874, and exclusive of any sum or sums received from the Government, the sale of booth sites, entrance fees, gate money, rent of yards, rent of farm, sale of farm produce, sale of dinner tickets, sale of show-yard fixtures, sale of catalogues, commission on sales, forfeited prizes, sweepstakes, or from any other source; also showing the amount paid away in prizes by the said society during the same period, except prizes for exhibits as follow, viz. :—Dogs, other than sheep and cattle dogs; birds, other than pigeons and poultry; wax, feather, and paper flowers; needlework of every description; sewing-machines; rabbits, hares, cats, guinea pigs, deer, native animals of all kinds, and mining machinery.

Revenue, except as above excepted.			Prize Money paid except as above excepted.
Members' Subscriptions.	Private Donations.	Total.	
£ s. d.	£ s. d.	£ s. d.	£ s. d.

Treasurer of the Agricultural Society.

Date—

(B.)

DECLARATION.

I, the Treasurer of the Agricultural Society, do solemnly and sincerely declare that the amount paid away in prizes by the said society between the 1st January 1874 and the 31st December 1874, except prizes for exhibits as follow, viz.:—Dogs, other than cattle and sheep dogs; birds, other than pigeons and poultry; wax, feather, and paper flowers; needlework of every description; sewing-machines; rabbits, hares, cats, guinea pigs, deer, native animals of all kinds, and mining machinery—amounted to the sum of pounds shillings and pence (£); and I further declare that the revenue of the said society derived from members' subscriptions and private donations, and exclusive of any sum or sums received from the Government, the sale of booth sites, entrance fees, gate money, rent of yards, rent of farm, sale of farm produce, sale of dinner tickets, sale of show-yard fixtures, sale of catalogues, commission on sales, forfeited prizes, sweepstakes, or from any other source, amounted, during the same period, to the sum of pounds shillings and pence (£).

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of an Act of the Parliament of Victoria rendering persons making a false declaration punishable for wilful and corrupt perjury.

Treasurer of the
Agricultural Society.

Declared before at this day of 187 .
Justice of the Peace.

AGRICULTURAL SOCIETIES.

The Administrator of the Government, with the advice of the Executive Council, has made the following additional Regulations for the distribution of portion of the unappropriated balance of the sum granted by Parliament in aid of the funds of Agricultural Societies, 1874–5, viz.:—

1. That the sum of Four hundred and eleven pounds nineteen shillings and seven pence be paid to the undermentioned societies in the sums hereunder specified, in order to make the amount claimable by each equal to the sum that it would have been entitled to receive had

regulations been in force similar to those under which the distribution of the vote 1873–4 was made :—

Name of Society.	Amount. £	s.	d.
Apsley	44	0	0
Ararat	19	15	0
Baringhup	8	17	9
Bendigo	78	11	3
Coleraine	43	15	0
Geelong	64	7	1
Kyneton	42	8	9
Melton	27	17	6
Merino and Sandford	47	5	0
South Bourke	31	17	3
Western District	3	5	0
	£411	19	7

2. That the sum of One hundred and fifty pounds be divided equally between the Ballarat, Warrnambool, and Romsey Farmers' Clubs.

J. J. CASEY,
Minister of Lands and Agriculture.

Department of Agriculture,
Melbourne, 26th April 1875.

SCHEDULE of Distribution of Vote in aid of the Funds of the Horticultural Societies of Victoria, 1874–5, in accordance with the Regulations approved by the Governor in Council, 25th January 1875.

—	Amount of Claim. £	s.	d.	Claim Reduced *pro rata*. £	s.	d.
Ballarat Horticultural Society	150	14	0	79	14	0
Brighton Horticultural Society	126	3	6	66	14	8
Horticultural Society of Victoria, Melbourne	500	10	6	264	14	4
Victorian Horticultural Improvement Society, Melbourne	168	0	0	88	17	0
	945	8	0	500	0	0

STATEMENT showing the Amount paid to the undermentioned Societies out of the sum of Seven thousand pounds granted by Parliament in aid of the Funds of Agricultural Societies, 1874–5, in accordance with Regulations and Additional Regulations for the expenditure thereof. Also showing the Revenue derived by each Society from Members' Subscriptions and Private Donations only between 1st January 1874 and 31st December 1874, and the Amount of Prize Money paid by it during the same period.

Name of Society.	Address.	Revenue from Members' Subscriptions and Private Donations.	Prize Money.	Extra Claim.	Amounts Paid.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
Apsley (1)	Edenhope	97 8 0	88 0 0	..	44 0 0
Ararat (2)	Ararat	72 9 6	184 9 0	19 15 0	92 4 6
Bacchus Marsh	Bacchus Marsh	171 15 0	159 5 0	..	106 3 4
Ballarat (3)	Learmonth	617 15 0	1,092 4 0	..	617 15 0
Baringhup (2)	Baringhup	64 5 6	146 6 6	8 17 9	73 3 3
Beaufort	Beaufort	112 13 0	122 15 0	..	81 16 8
Belfast	Belfast	108 5 0	157 2 6	..	104 15 0
Bendigo (2)	Sandhurst	195 3 0	547 8 6	78 11 3	273 14 3
Chiltern	Chiltern	101 0 0	117 15 0	..	78 10 0
Coleraine (1)	Coleraine	78 3 0	87 10 0	..	43 15 0
Dandenong	Dandenong	141 11 6	129 5 0	..	86 3 4
Echuca	Echuca	150 0 0	123 0 0	..	82 0 0
Geelong (2)	Geelong	362 16 3	854 6 8	64 7 1	427 3 4
Gippsland North (3)	Maffra	78 0 0	134 10 0	..	78 0 0
Glendaruel	Clunes	143 9 6	197 13 0	..	131 15 4
Glenlyon (3)	Glenlyon	125 7 0	207 0 0	..	125 7 0
Hamilton (3)	Hamilton	232 19 0	388 0 0	..	232 19 0
Hampden and Heytesbury	Camperdown	113 14 0	158 17 6	..	105 18 4
Hardie's Hill	Grenville	288 18 6	255 17 6	..	170 11 8
Hexham Long-woolled Sheep Association	Hexham	169 12 6	119 5 0	..	79 10 0
Kilmore	Kilmore	155 0 0	118 15 0	..	79 3 4
Kyneton (2)	Kyneton	286 12 6	658 2 6	42 8 9	329 1 3
Melton (1)	Melton	76 19 0	55 15 0	..	27 17 6
Merino and Sandford (1)	Sandford	51 11 6	94 10 0	..	47 5 0
Mornington (3)	Cranbourne	75 16 0	116 14 0	..	75 16 0
Newstead	Sandon	112 0 0	152 12 0	..	101 14 8
North-Western	Newbridge	149 12 0	210 9 0	..	140 6 0
Ovens and Murray	Wangaratta	327 10 0	302 10 0	..	201 13 4
Polwarth and Grenville	Colac	182 0 0	265 19 0	..	177 6 0
Smeaton	Smeaton	490 0 0	675 19 6	..	450 13 0
South Bourke (1)	Box Hill	74 14 5	63 14 6	..	31 17 3
Talbot	Talbot	223 10 0	253 15 0	..	169 3 4
Victoria	Kangaroo Ground	299 8 0	302 0 0	..	201 6 8
Villiers and Heytesbury (3)	Warrnambool	151 3 0	284 10 6	..	151 3 0
Wahgunyah	Wahgunyah	45 12 0	58 15 0	..	45 12 0
West Bourke	Romsey	261 14 6	165 15 0	..	110 10 0
Western District (2)	Skipton	158 0 0	322 10 0	3 5 0	161 5 0
Wimmera	Stawell	170 19 6	192 15 11	..	128 10 7
The following items have likewise been paid out of the vote:—					5,665 8 11
National, Melbourne (4)				..	500 0 0
Farmers' Clubs (5)—					
Ballarat Farmers' Club				£50 0 0	
Romsey "				50 0 0	
Warrnambool "				50 0 0	
					150 0 0
Total					6,315 8 11

(1) According to clause 5 of the regulations of the 25th January 1875, the societies to whose name the figure "1" is affixed were not entitled to participate in the vote, inasmuch as the sum paid by them in prizes between 1st January and 31st December 1874 did not amount to £100; but a claim, to the extent of one-half of the prize money paid away during the year 1874, has been admitted under additional regulations of the 26th April 1875, upon the distinct understanding that all of the societies shall conform in future to the new regulations.

(2) In the instances of the societies to whose names the figure "2" is affixed two-thirds of the amount paid away in prizes exceeded the revenue derived from members' subscriptions and private donations. After reducing the claim to the amount of the revenue so derived, an extra claim under additional regulations of the 26th April 1875 was allowed, in order to make the sum claimable by each society equal to the amount that it would have been entitled to receive had regulations been in force similar to those under which the distribution of the vote 1873–4 was made.

(3) The two-thirds of the amount paid away in prizes by the societies to whose names the figure "3" is affixed exceeded the revenue derived from members' subscriptions and private donations, and was therefore reduced in accordance with clause 2 of regulations.

(4) The sum of Five hundred pounds was paid to the National Agricultural Society of Victoria, in accordance with clause 4 of regulations.

(5) In accordance with clause 6 of the regulations, the sum of One hundred and fifty pounds was divided among the Farmers' Clubs of Victoria.

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Royal Botanic Gardens Victoria
RBG00021194